

קונסטרוקציות בטון

דפי עזר ונוסחאות

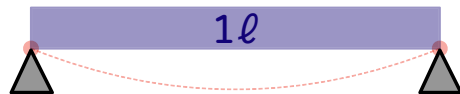
למדא - חזקים בבטון

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- מאגר מפתחים שקילים
- העברת עומסים - שיטה מדויקת
- העברת עומסים - שיטת מקורבת
- נוסחאות מקוצרות
- סד"פים
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מאגר סכמות מפתחים שקילים

פרק-פרק



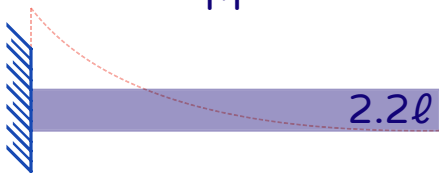
פרק-ריתום



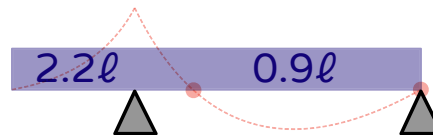
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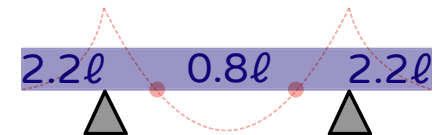
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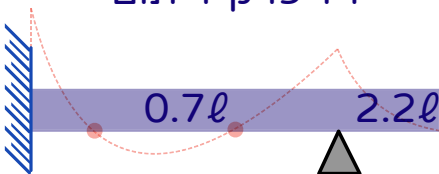
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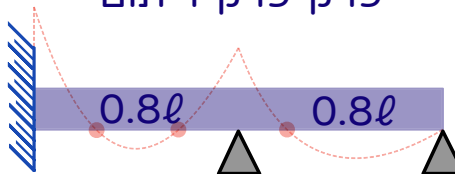
זיז-שדה זיז



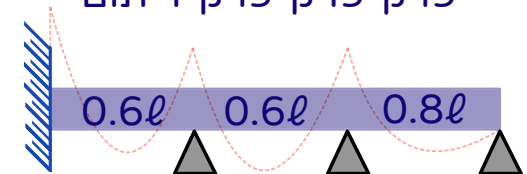
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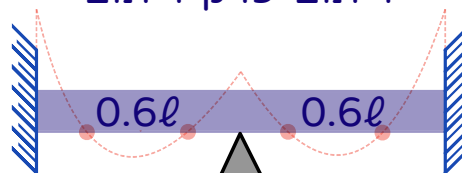
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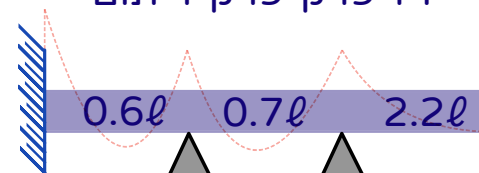
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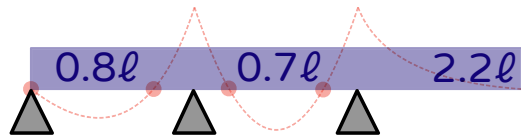
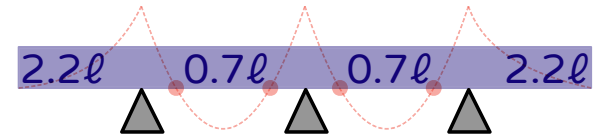
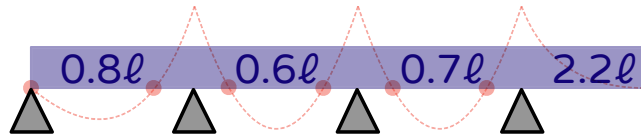
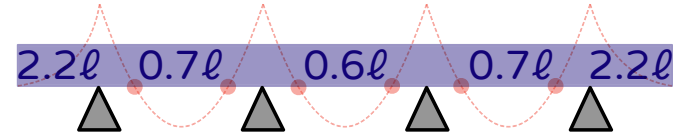
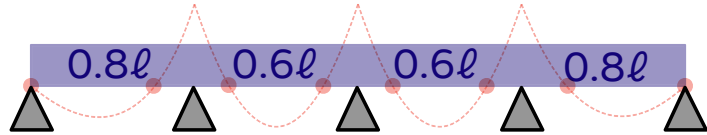
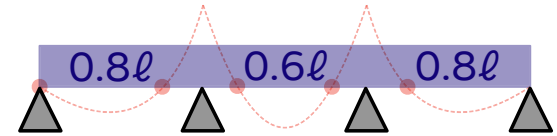
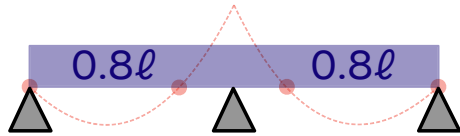
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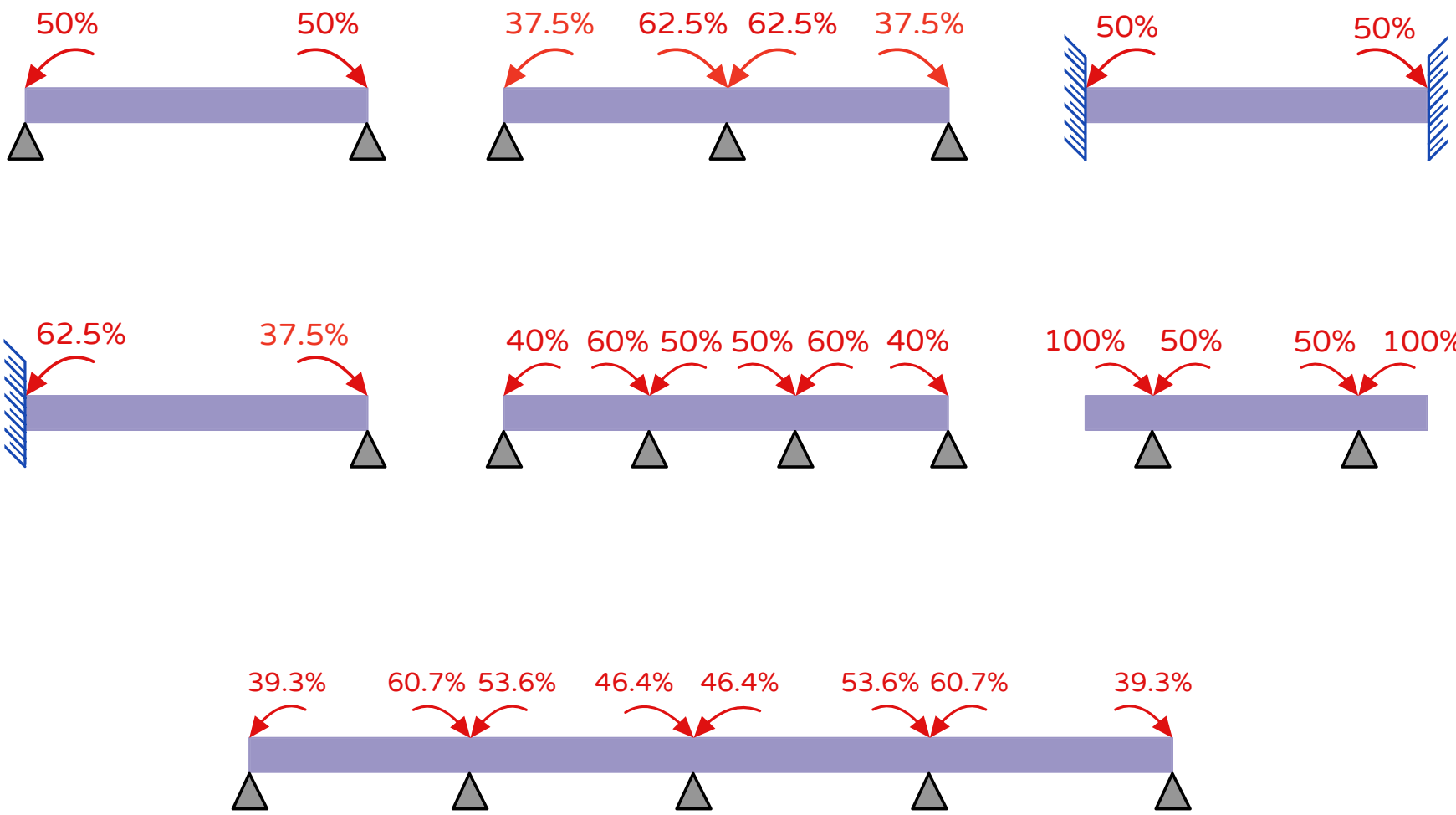
זיז-פרק-פרק-ריתום



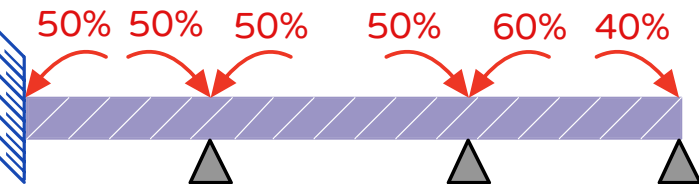
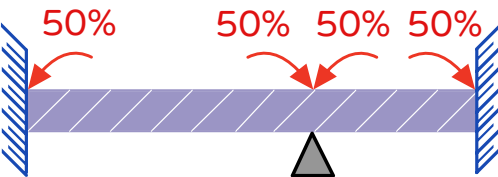
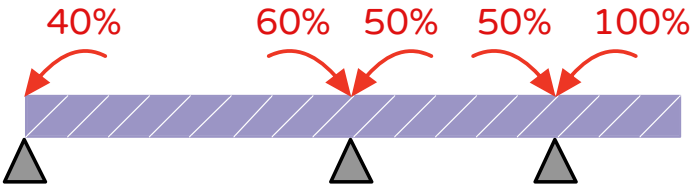
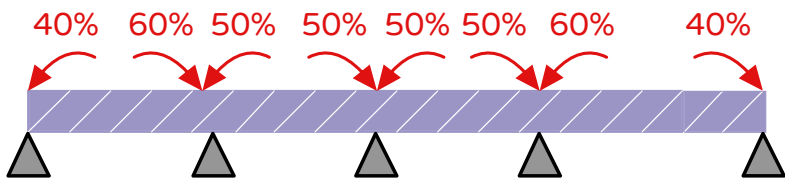
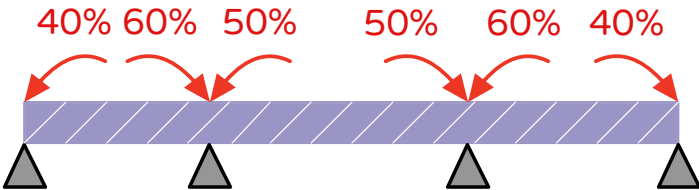
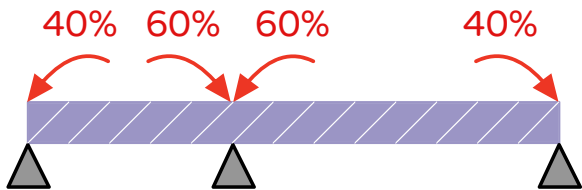
סכמות מרובות סמכים



$R = \text{מקדם} \times \text{עומס} \times \text{מפתח}$

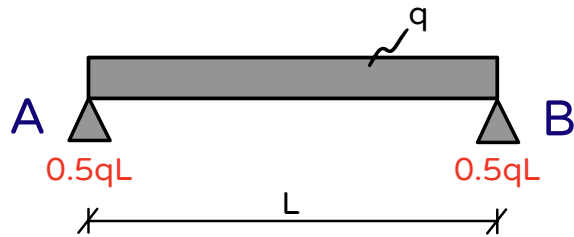


$R = \text{מקדם} \times \text{עומס} \times \text{מפתח}$

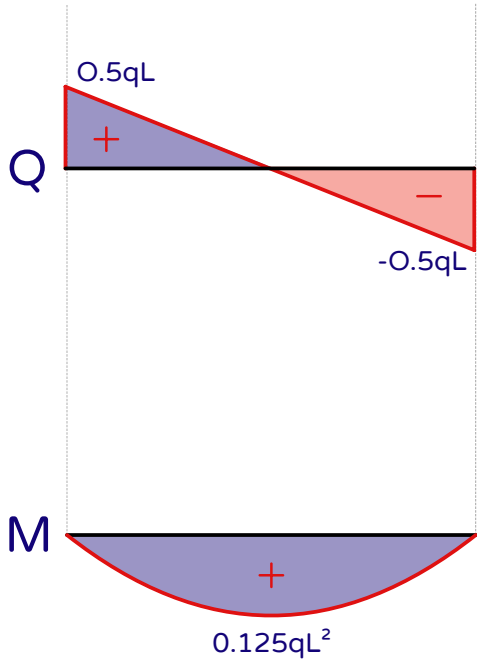


נוסחאות מקוצרות לחישוב תגובות, מהלכי גזירה & מומנטים

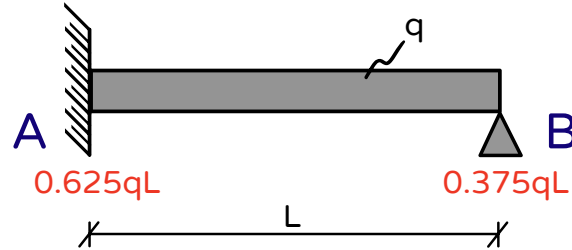
פרק-פרק



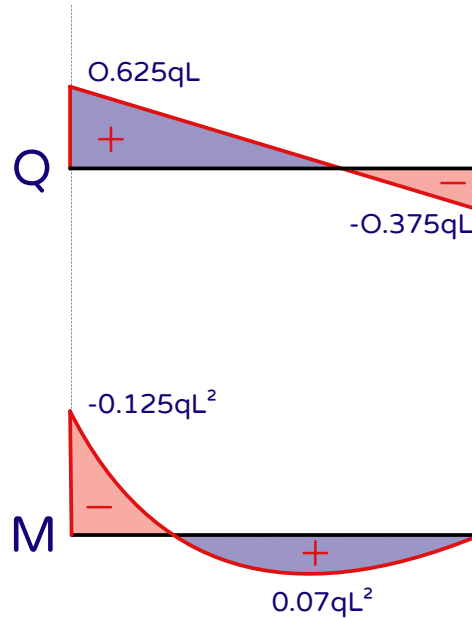
Reactions: $0.5qL$ at A, $0.5qL$ at B



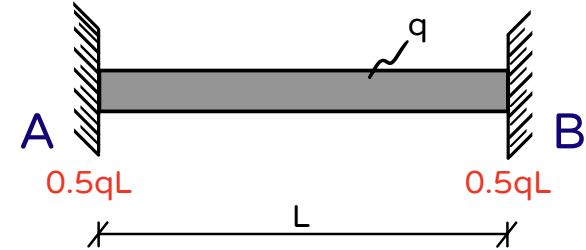
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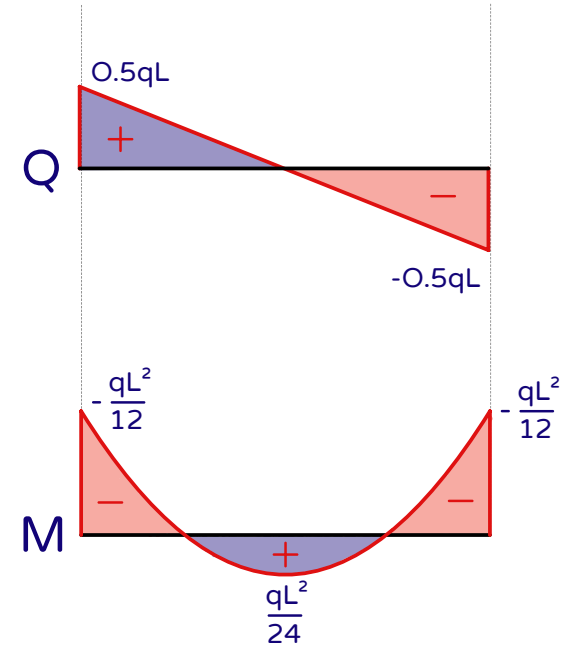
Reactions: $0.625qL$ at A, $0.375qL$ at B



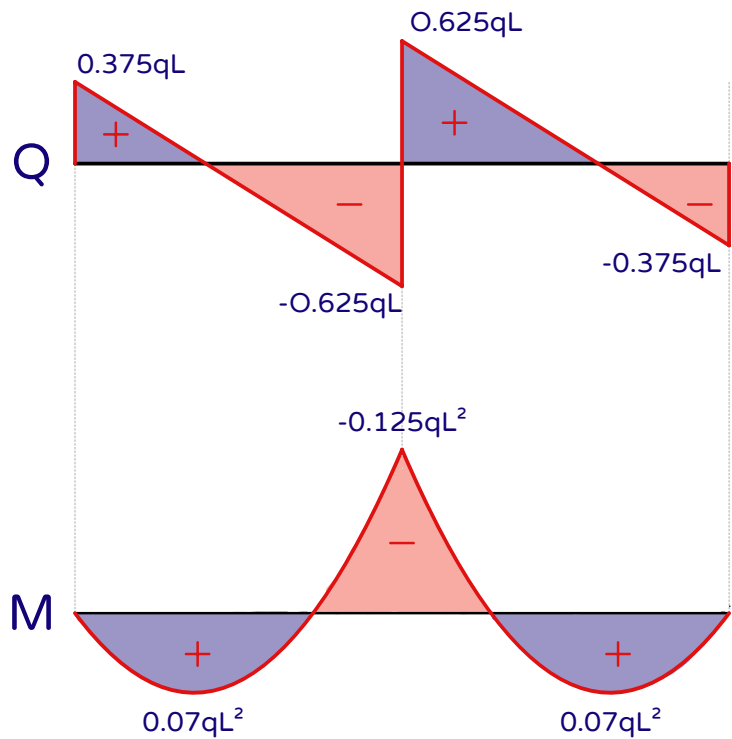
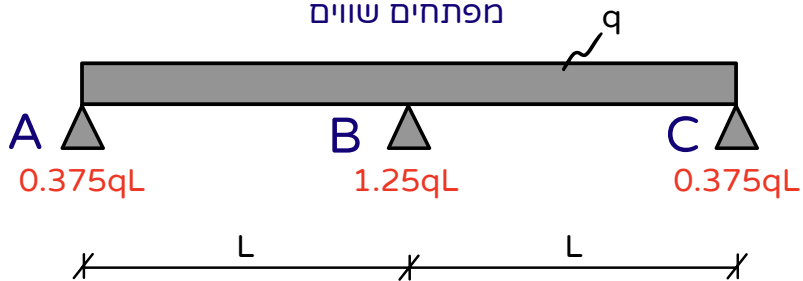
ריתום-ריתום



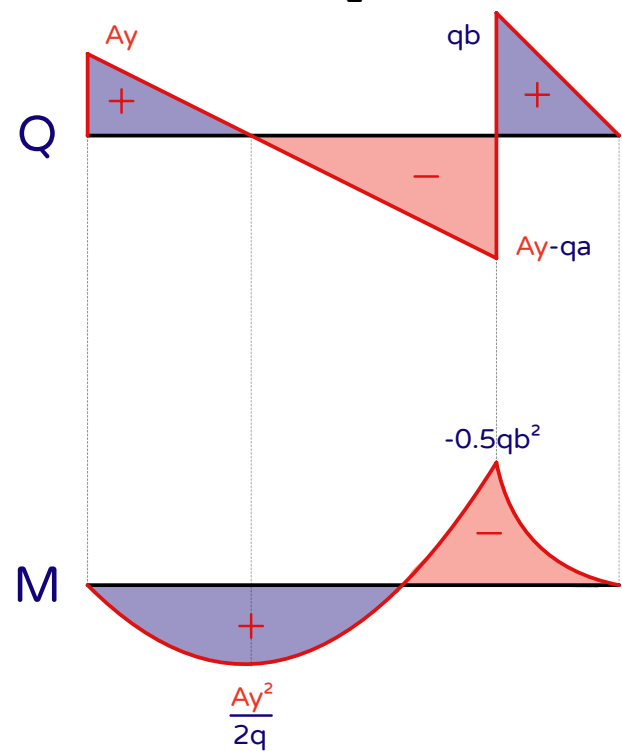
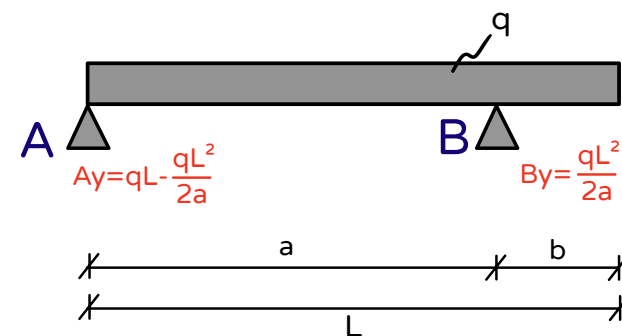
Reactions: $0.5qL$ at A, $0.5qL$ at B



3 סמכים מפתחים שווים

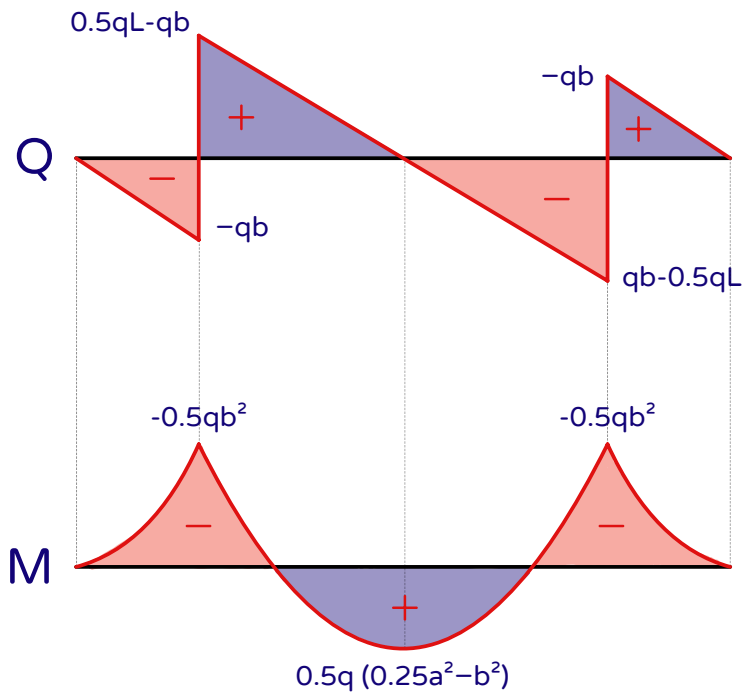
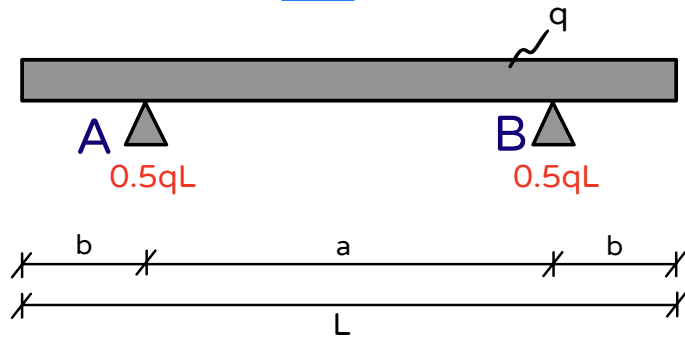


זיז-פרק



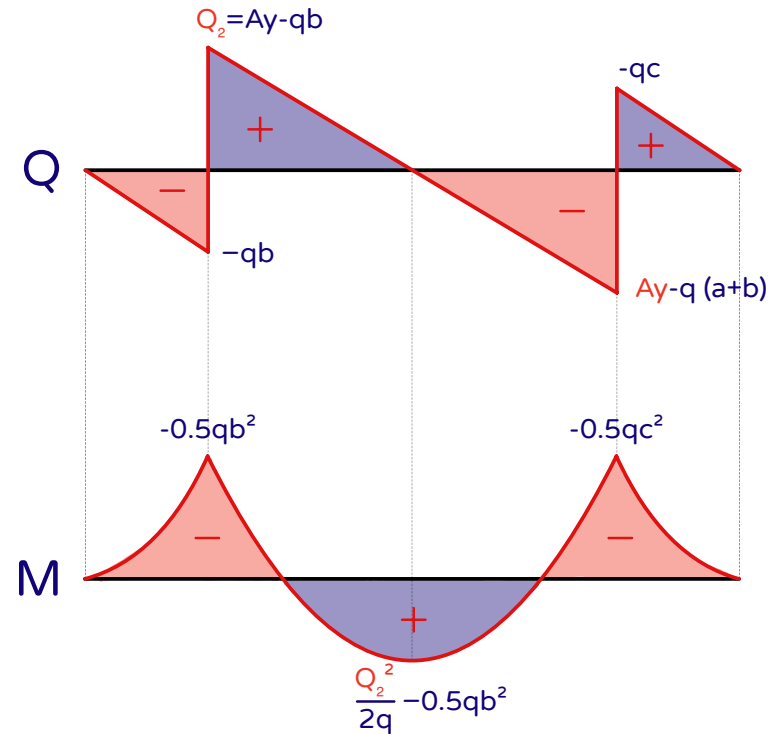
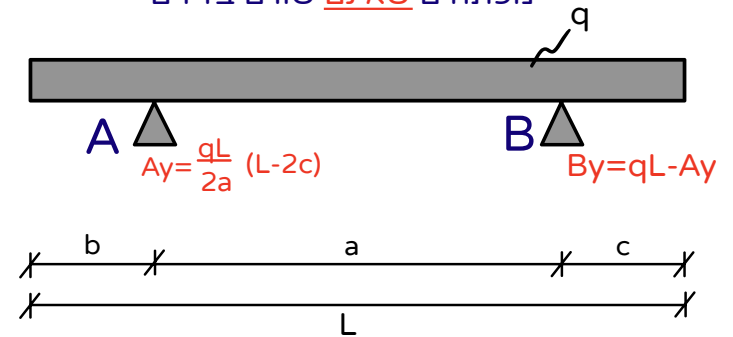
2 סמכים & זידים

מפתחים שוים בזידים

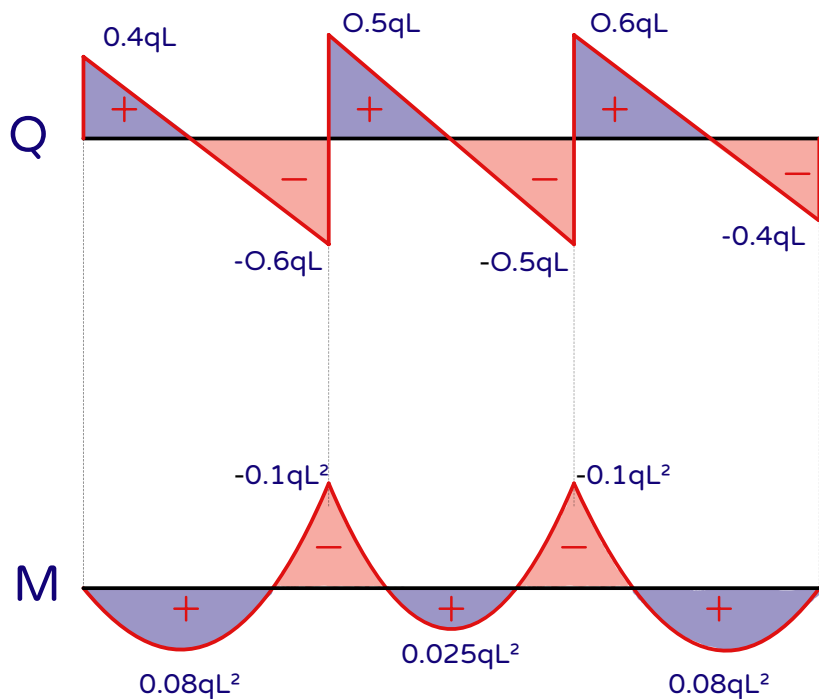
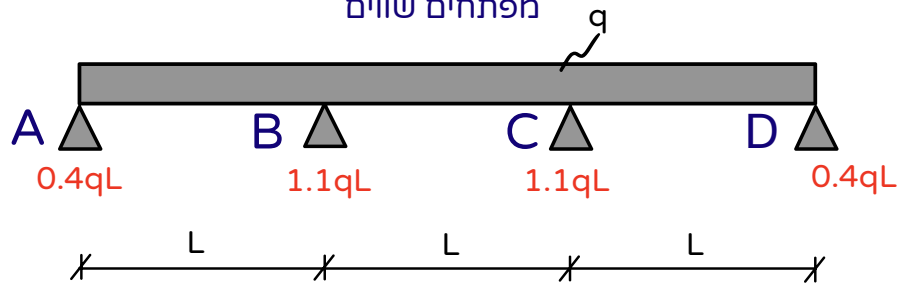


2 סמכים & זידים

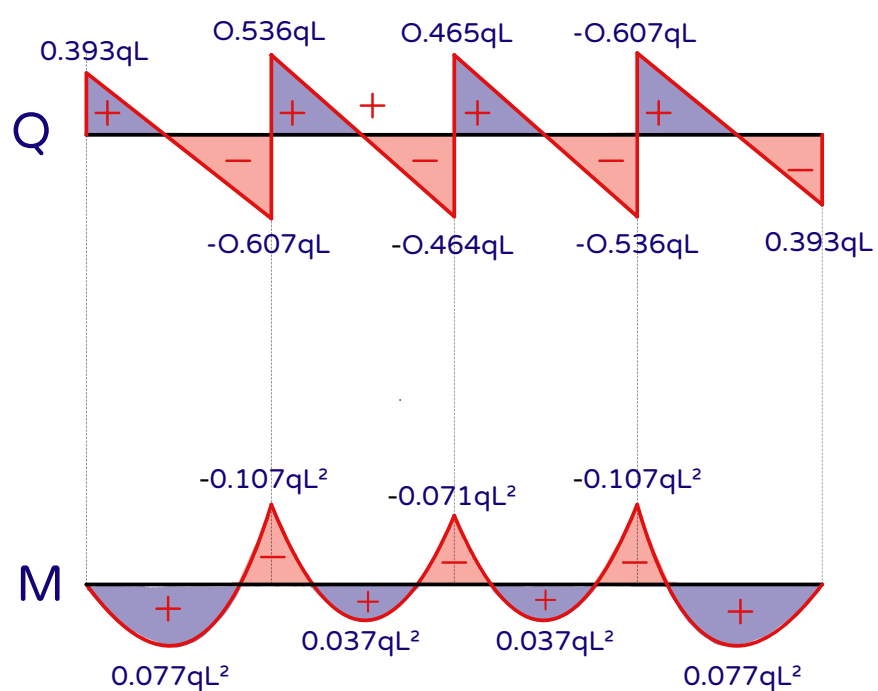
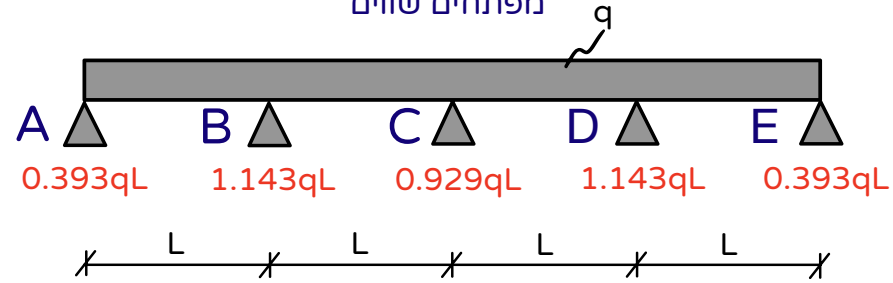
מפתחים שאינם שווים בזידים



סמכים 4
מפתחים שווים



סמכים 5
מפתחים שווים



תכנון תקרה מקשית מתוחה בכיוון אחד - תכן ושטחי זיון			
הערה	נוסחאות		שלב
$Gk = s.w + \Delta g$	$Fdmax = 1.6Qk_{\left[\frac{kn}{m^2}\right]} + 1.4Gk_{\left[\frac{kn}{m^2}\right]}$		חישוב עומסי תכן
	$Fdmin = 1.2Gk_{\left[\frac{kn}{m^2}\right]}$		
זיז	$Fdmin = Gk_{\left[\frac{kn}{m^2}\right]}$		
	במידה ונדרש לשרטט מצבי עמיסה מסוכנים		חישוב ושרטוט מצבי העמסה
	$ASmin_{[cm^2]} = \rho min * b_{[cm]} * d_{[cm]}$ $ASmax_{[cm^2]} = \rho max * b_{[cm]} * d_{[cm]}$		חישוב מגבלות שטחי זיון
$\omega min = 0.1$ $\omega max = 0.4$	$\omega = 1 - \left(1 - \frac{2 * Md_{[kn*m]}}{b_{[m]} * d_{[cm]}^2 * fcd_{\left[\frac{kn}{cm^2}\right]}}\right)^{0.5}$		חישוב יחס חלק לחוץ בחתך - אומגה ω
	$AS_{[cm^2]} = \frac{Md_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{\left[\frac{kn}{cm^2}\right]}}$		בחירת שטח חתך הזיון המתוח
	קוטר מינימלי 8 ס"מ קוטר מקסימלי 18 ס"מ פסיעה מקסימלית של 10 ס"מ		פרט זיון ראשי
	עומס מרוכז	עומס מפורס אחיד	בחירת ברזל מחלק
	$As = Max \begin{cases} 0.6 * As_{act} \\ 0.5 * As_{min} \end{cases}$	$As_{עליון} = Max \begin{cases} 0.2 * As_{act} \\ 0.5 * As_{min} \end{cases}$ $As_{תחתון} = Max \begin{cases} 0.2 * As_{act} \\ 0.5 * As_{min} \end{cases}$	
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תכנון תקרה מקשית מתוחה בכיוון אחד - בדיקת כפף			
הערה	נוסחאות	שלב	
		שרטוט כל הסכמות בתקרה	1
	$\ell_0 = K * L$	חישוב מפתחים שקילים וקביעת מפתח שקיל מקסימלי	2
אם נתון גובה יש לדלג על סעיף זה	$H_{משוער} = \frac{\ell_{0(max)}}{25}$	הנחת גובה תקרה משוער	3
	חתך מלבני = 1	חישוב K11	4
		חישוב עומסי שירות	5
	$s.w_{\left[\frac{kn}{m^2}\right]} = 25_{\left[\frac{kn}{m^3}\right]} * h_{[m]}$	משקל עצמי של התקרה	
נתון בסעיף	$\Delta g_{\left[\frac{kn}{m^2}\right]}$	עומס קבוע נוסף	
	$Qk_{\left[\frac{kn}{m^2}\right]}$	עומס שימושי	
	$Fser_{\left[\frac{kn}{m^2}\right]} = s.w_{\left[\frac{kn}{m^2}\right]} + \Delta g_{\left[\frac{kn}{m^2}\right]} + Qk_{\left[\frac{kn}{m^2}\right]}$	סה"כ עומסים	
	הוצאת נתון מטבלאות k12	חישוב K12	6
עפ"י סוג הבטון - נתון בשאלה ב30 - גירי - 1 ב30 - דולומיטי - 1.04 ב40 - גירי - 1.02 ב40 - דולומיטי - 1.07	נתון בסעיף השאלה	חישוב K13	7
	$h_{[m]} \geq \frac{\ell_{0max[m]}}{k11 * k12 * k13}$	בדיקת כפף	8
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תכנון תקרה מקשית מתוחה בכיוון אחד - חישוב עומס שימושי לפי ברזל נתון		
הערה	נוסחאון	שלב
	טבלאות שטח ברזל לתקרה מקשית	1 הוצאת שטח עפ"י ברזל נתון
	$\omega = \frac{As_{[cm^2]} * fsd_{[cm^2]}^{kn}}{b_{[cm]} * d_{[cm]} * fcd_{[cm^2]}^{kn}}$	2 חישוב יחס אזור לחוץ בחתך
	$Md_{[kn*m]} = As_{[cm^2]} * \left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{[cm^2]}^{kn}$	3 חישוב מומנט תכן מותר
$q=fd$	השוואת המומנט שקבלנו לנוסחת המומנט בהתאם לסכמה	4 מציאת FD כפונקציה של מומנט התכן
$Qk = \frac{Fd - 1.4Gk}{1.6}$	FD=FDMAX=1.6QK+1.4GK	5 השוואה לFDMAX וחשוב עומס שימושי
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תכנון תקרה מקשית מתוחה בכיוון אחד - חישוב עומס שימושי לפי תסבולת		
הערה	נוסחאון	שלב
	$McdMax_{[kn*m]} = 0.32 * b_{[m]} * d^2_{[cm]} * fcd_{[cm^2]}^{kn}$	1 חישוב מומנט תסבולת
$q=fd$	השוואת המומנט שקבלנו לנוסחת המומנט בהתאם לסכמה	2 מציאת FD כפונקציה של מומנט התכן
$Qk = \frac{Fd - 1.4Gk}{1.6}$	FD=FDMAX=1.6QK+1.4GK	3 השוואה לFDMAX וחשוב עומס שימושי
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תכנון תקרה מקשית מתוחה בכיוון אחד - חישוב עומס שימושי לפי כפף		
הערה	נוסחאון	שלב
		1 שרטוט כל הסכמות בתקרה
	$\ell_0 = K * L$	2 חישוב מפתחים שקילים וקביעת מפתח שקיל מקסימלי
	חתך מלבני 1 =	3 חישוב K11
	נתון בשאלה	4 חישוב K13
	עפ"י סוג הבטון - נתון בשאלה 30 - גירי - 1 30 - דולומיטי - 1.04 40 - גירי - 1.02 40 - דולומיטי - 1.07	
	$K12 = \frac{\ell_0 max[m]}{h_{[m]} * k11 * k13}$	5 חישוב K12
בהתאם לגובה תקרה נתון	$s.w_{[m^2]}^{kn} = 25_{[m^3]}^{kn} * h_{[m]}$	6 משקל עצמי של התקרה
	טבלאות k12	7 הוצאת Fser מהטבלה
	$Qk_{[m^2]}^{kn} = Fser_{[m^2]}^{kn} - s.w_{[m^2]}^{kn} - \Delta g_{[m^2]}^{kn}$	8 חישוב עומס שימושי
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תכנון קורות בחתך מלבני – תכן ושטחי זיון		
הערה	נוסחאון	שלב
	$FDmax_{\left[\frac{kn}{m}\right]} = 1.6Qk_{\left[\frac{kn}{m}\right]} + 1.4Gk_{\left[\frac{kn}{m}\right]}$	1 חישוב עומסי תכן
	$FDmin_{\left[\frac{kn}{m}\right]} = 1.2Gk_{\left[\frac{kn}{m}\right]}$	
זיז	$FDmin_{\left[\frac{kn}{m}\right]} = Gk_{\left[\frac{kn}{m}\right]}$	
		2 חישוב ושרטוט מצבי העמסה
	$ASmin_{[cm^2]} = \rho min * b_{[cm]} * d_{[cm]}$ $ASmax_{[cm^2]} = \rho max * b_{[cm]} * d_{[cm]}$	3 חישוב מגבלות שטחי זיון
$\omega \min = 0.1$ $\omega \max = 0.4$	$\omega = 1 - \left(1 - \frac{2Md_{[kn*m]}}{b_{[m]} * d_{[cm]}^2 * fcd_{\left[\frac{kn}{cm^2}\right]}}\right)^{0.5}$	4 חישוב יחס חלק לחוץ בחתך – אומגה ω
	$AS_{[cm^2]} = \frac{Md_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{\left[\frac{kn}{cm^2}\right]}}$	5 חישוב שטח זיון המתוח
במצב זה המומנט גדול ממומנט התסבולת Mcdmax	$\omega > 0.4$	6 במידה ונדרש זיון לחוץ אומגה $0.4 <$
	$McdMax_{[kn*m]} = 0.32 * b_{[m]} * d^2[cm] * fcd_{\left[\frac{kn}{cm^2}\right]}$	
בחירת ברזל לפי טבלאות שטח לקורות	$As'_{[cm^2]} = \frac{Md_{[kn*m]} - McdMax_{[kn*m]}}{(d - d'_s)_{[m]} * fsd_{\left[\frac{kn}{cm^2}\right]}}$	
	$As_{[cm^2]} = As'_{act [cm^2]} + \frac{McdMax_{[kn*m]}}{0.8 * d_{[m]} * fsd_{\left[\frac{kn}{cm^2}\right]}}$	
	$H_{[cm]} = \left(\frac{md_{[kn*m]}}{0.32 * b_{[m]} * fcd_{\left[\frac{kn}{cm^2}\right]}}\right)^{0.5} + ds_{[cm]}$	
גובה חתך דרוש למניעת זיון לחוץ		
7		
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תכנון קורות בחתך מלבני - בדיקת כפף		
הערה	נוסחאון	שלב
		1 שרטוט כל הסכמות
	$\ell_0 = K * L$	2 חישוב מפתחים שקילים וקביעת מפתח שקיל מקסימלי
	$H_{[m]} = \frac{l_{0[m]}}{8}$	3 הנחת גובה קורה משוער
		חישוב עומסי שירות
	$s.w_{[kn]} = 25_{[m^3]} * b_{[m]} * h_{[m]}$	משקל עצמי של הקורה
	$\Delta g_{[kn]}_{[m]}$	עומס קבוע נוסף
	$Qk_{[kn]}_{[m]}$	עומס שימושי
	$Fser_{[kn]}_{[m^2]} = \frac{s.w_{[kn]}_{[m]} + \Delta g_{[kn]}_{[m]} + Qk_{[kn]}_{[m]}}{b_{[m]}}$	סה"כ עומסים
	הוצאת נתון מטבלאות k12	5 חישוב k12
	חתך מלבני $1 =$	6 חישוב k11
	נתון בשאלה	7 חישוב k13
	$h_{[m]} \geq \frac{\ell_{0max[m]}}{k11 * k12 * k13}$	8 בדיקת כפף
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עפ"י סוג הבטון - נתון בשאלה
30- גירי - 1
30- דולומיטי - 1.04
40- גירי - 1.02
40- דולומיטי - 1.07

תכנון קורות בחתך מלבני - זיון לגזירה

הערה	נוסחאון	שלב	
	$St, max = \min \left\{ \begin{matrix} 40_{[cm]} \\ 0.75d_{[cm]} \end{matrix} \right.$	חישוב מרחק בין ענפים	1
עובי כיסוי בטון C	$n = \frac{b_{[cm]} - 2 * C_{[cm]}}{St} + 1$	חישוב כמות ענפים	2
	$Sv, max = \min \left\{ \begin{matrix} 30_{[cm]} \\ 0.75d_{[cm]} \\ \frac{Asv_{[cm^2]}}{Pvmin * bw_{[cm]}} \end{matrix} \right.$ $Sv, min = \frac{Asv_{[cm^2]}}{Pvmin * bw_{[cm]}}$	חישוב פסיעה מקסי'	3
	$Sv_{[cm]} = \frac{0.9 * d_{[cm]} * Asv_{[cm^2]} * fsd_{[cm^2]}^{[kn]}}{Vd_{[kn]}}$	חישוב פסיעה לפי קוטר נתון	4
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תכנון קורות בחתך מלבני - קביעת רוחב קורה

הערה	נוסחאון	שלב	
		סרטוט סכמת הקורה	1
		קביעת מפתח שקיל רלוונטי	2
יש להוסיף משקל עצמי בהתאם	$Fser_{(m)}^{(kn)}$ - העברת עומסים	חישוב עומסים הפועלים על הקורה	3
הוצאת FSER מהטבלה	$K12 = \frac{\ell_0[m]}{h_{[m]} * k11 * k13}$	חישוב K12	4
	$b_{(m)} = \frac{Fser_{(m)}^{(kn)}}{Fser_{(m^2)}^{(kn)}}$	חישוב רוחב קורה	5
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תכנון קורות בחתך מלבני - גזירה

תכנון קורות בחתך מלבני – גזירה			
הערה	נוסחאון	שלב	
השענה לא ישירה אין תוספת של d	$Vd_{[kn]} = V_{[kn]} - Fd_{[kn]} * \left(\frac{b}{2} + d_{[m]}\right)$	חישוב כח תכן לגזירה	1
מקדם תיקון גובה	שטח זיון מתוח בחתך	חישוב תסבולת ללא זיון לגזירה	2
$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$	$100\rho = \frac{100 * As_{[cm^2]}}{b_{[cm]} * d_{[cm]}}$		
$Vrdc = \max \begin{cases} 0.12K (100\rho * 0.7 fck_{[\frac{n}{mm^2}]})^{\frac{1}{3}} * \frac{bw_{[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck_{[\frac{n}{mm^2}]})^{0.5} * \frac{bw_{[mm]} * d_{[mm]}}{1000} \end{cases}$			3
חישוב תסבולת לגזירה (זיון מקסימלי)			
$VrdMax = 0.6(1 - 0.7 * \frac{fck_{[\frac{n}{mm^2}]}}{250}) * \frac{0.9bw_{[mm]} * d_{[mm]} * fcd_{[\frac{n}{mm^2}]}}{2000}$			4
$VD \leq VRdc$ = נדרש מינימלי זיון	קביעת מקרה		
$VD > VRdc$ = נדרש זיון מחושב			
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תכנון קורות בחתך מלבני - חישוב עומס שימושי לפי ברזל נתון		
הערה	נוסחאות	שלב
	טבלאות שטח ברזל לתקרה מקשית	1 הוצאת שטח עפ"י ברזל נתון
	$\omega = \frac{As_{[cm^2]} * fsd_{[\frac{kn}{cm^2}}]}{b_{[cm]} * d_{[cm]} * fcd_{[\frac{kn}{cm^2}]}}$	2 חישוב יחס אזור לחוץ בחתך
	$Md_{[kn*m]} = As_{[cm^2]} * \left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{[\frac{kn}{cm^2}]}$	3 חישוב מומנט תכן מותר
$q=fd$	השוואת המומנט שקבלנו לנוסחת המומנט בהתאם לסכמה	4 מציאת FD כפונקציה של מומנט התכן
$Qk = \frac{Fd - 1.4Gk}{1.6}$	FD=FDMAX=1.6QK+1.4GK	5 השוואה לFDMAX וחשוב עומס שימושי
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תכנון קורות בחתך מלבני - חישוב עומס שימושי לפי כפף		
הערה	נוסחאות	שלב
		1 שרטוט כל הסכמות
	$\ell_0 = K * L$	2 חישוב מפתחים שקילים וקביעת מפתח שקיל מקסימלי
	חתך מלבני 1 =	3 חישוב K11
עפ"י סוג הבטון - נתון בשאלה ב30 - גירי - 1 ב30 - דולומיטי - 1.04 ב40 - גירי - 1.02 ב40 - דולומיטי - 1.07	נתון בשאלה סוג בטון	4 חישוב K13
	$K12 = \frac{\ell_0 \max[m]}{h_{[m]} * k11 * k13}$	5 חישוב K12
		6 הוצאת Fser מהטבלה
	$Fser_{[\frac{kn}{m}]} = Fser_{[\frac{kn}{m^2}]} * b_{[m]}$	7 חישוב עומס שירות קורה
	$Qk_{[\frac{kn}{m}]} = Fser_{[\frac{kn}{m}]} - s.w_{[\frac{kn}{m}]} - \Delta g_{[\frac{kn}{m}]}$	8 חישוב עומס שימושי
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תכנון קורות בחתך מלבני - חישוב עומס שימושי לפי תסבולת		
הערה	נוסחאות	שלב
	$McdMax_{[kn*m]} = 0.32 * b_{[m]} * d^2_{[cm]} * fcd_{[\frac{kn}{cm^2}]}$	1 חישוב מומנט תסבולת
$q=fd$	השוואת המומנט שקבלנו לנוסחת המומנט בהתאם לסכמה	2 מציאת FD כפונקציה של מומנט התכן
$Qk = \frac{Fd - 1.4Gk}{1.6}$	FD=FDMAX=1.6QK+1.4GK	3 השוואה לFDMAX וחשוב עומס שימושי
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תכנון קורות בחתך מלבני - חישוב עומס שימושי לפי חישוק לגזירה

הערה	נוסחאון	שלב	
		חישוב תסבולת לגזירה	
	$VrdMax = 0.6(1 - 0.7 * \frac{fck[\frac{n}{mm^2}]}{250}) * \frac{0.9bw_{[mm]} * d_{[mm]} * fcd[\frac{n}{mm^2}]}{2000}$		1
כמות ענפים = n	חישוב $Asv_{[cm^2]} = n * AS_{[cm^2]}$	חישוב שטח ענפים נתון	2
	$Vrd, s_{[kn]} = \frac{0.9 * d_{[cm]} * Asv_{[cm^2]} * fsd[\frac{kn}{cm^2}]}{Sv_{[cm]}}$	חישוב כח תכן מותר לגזירה	3
	Qd בהתאם לסכמת מהלכי גזירה	מציאת ערך גזירה	4
	$Vrd, s_{[kn]} = Qd_{[kn]} - Fd_{[\frac{kn}{m}]} * (\frac{b}{2} + d_{[m]})$	חישוב עומס תכן	5
	FDMAX=FD=1.6QK+1.4GK	השוואת עומס תכן ומציאת עומס שימושי	6
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תכנון קורות בחתך מלבני - חישוב עומס שימושי לפי תסבולת גזירה

הערה	נוסחאון	שלב	
	שטח זיון מתוח בחתך	מקדם תיקון גובה	
	$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$	$100\rho = \frac{100 * As_{[cm^2]}}{b_{[cm]} * d_{[cm]}}$	חישוב תסבולת ללא זיון לגזירה
	$Vd_{[kn]} = \max \begin{cases} 0.12K (100\rho * 0.7 fck[\frac{n}{mm^2}])^{\frac{1}{3}} * \frac{bw_{[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck[\frac{n}{mm^2}])^{0.5} * \frac{bw_{[mm]} * d_{[mm]}}{1000} \end{cases}$		2
	$Vd_{[kn]} = Qd_{[kn]} - Fd_{[\frac{kn}{m}]} * (\frac{b}{2} + d_{[m]})$	חישוב עומס תכן	3
	FDMAX=FD=1.6QK+1.4GK	השוואת עומס תכן ומציאת עומס שימושי	4
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תכנון קורות בחתך משתנה - תכן ושטחי זיון לדופן לחוצה			
הערה	נוסחאות	שלב	
$Gk = s \cdot w + \Delta g$	$FDmax_{[\frac{kn}{m}]} = 1.6Qk_{[\frac{kn}{m}]} + 1.4Gk_{[\frac{kn}{m}]}$	חישוב עומסי תכן	1
	$FDmin_{[\frac{kn}{m}]} = 1.2Gk_{[\frac{kn}{m}]}$		
ז"ז	$FDmin_{[\frac{kn}{m}]} = Gk_{[\frac{kn}{m}]}$		
	במידה ונדרש לשרטט מצבי עמיסה מסוכנים	חישוב ושרטוט מצבי העמסה	2
$bt_{[cm]} = \frac{bf + bw}{2}$	$ASmin_{[cm^2]} = \rho min * bt_{[cm]} * d_{[cm]}$	חישוב מגבלות שטחי זיון	3
$\omega min = 0.1$ $\omega max = 0.4$	$\omega = 1 - \left(1 - \frac{2Md_{[kn*m]}}{bw_{[m]} * d_{[cm]}^2 * fcd_{[\frac{kn}{cm^2}]}}\right)^{0.5}$	חישוב יחס חלק לחוץ בחתך - אומגה ω	4
	$X = \omega * d$	בדיקת תחום אזור לחוץ	5
	$X \leq tw$	$X \geq tw$	
$McdMax_{[kn*m]} = 0.32 * bw_{[m]} * d^2[cm] * fcd_{[\frac{kn}{cm^2}]}$	$McdMax_{[kn*m]} = 0.64 * Sd_{[cm^3]} * \frac{fcd_{[\frac{kn}{cm^2}]}}{100}$		
$So_{[cm^3]} = (bf - bw) * tf * \left(d - \frac{tf}{2}\right) + \left(\frac{bw * d^2}{2}\right)$	חישוב מומנט סטטי (ס"מ)		
קביעת מצב תכנון			6
$X \leq tw$	א. תחום הדופן לחוץ ואין צורך בזיון לחוץ		7
$X \leq tw$	ב. תחום הדופן לחוץ ויש צורך בזיון לחוץ		
$X \geq tw$	ג. תחום הדופן והאגף לחוצים ואין צורך בזיון לחוץ		
$X \geq tw$	ד. תחום הדופן והאגף לחוצים ויש צורך בזיון לחוץ		
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תכנון קורות בחתך משתנה - בדיקת כפף			
הערה	נוסחאות	שלב	
		שרטוט כל הסכמות פ	1
	$\ell_0 = K * L$	חישוב מפתחים שקילים וקביעת מפתח שקיל מקסימלי	2
		חישוב עומסי שירות	4
$A_{(m^2)} = \text{שטח החתך}$	$s \cdot w_{[kn/m]} = 25_{[kn/m^3]} * A_{(m^2)}$	משקל עצמי של הקורה	5
	$\Delta g_{[kn/m]}$	עומס קבוע נוסף	6
	$Qk_{[kn/m]}$	עומס שימושי	7
bw לחוץ	bf לחוץ	זיהוי אזור לחוץ	8
$Fser_{[kn/m^2]} = \frac{s \cdot w_{[kn/m]} + \Delta g_{[kn/m]} + Qk_{[kn/m]}}{bw_{[m]}}$	$Fser_{[kn/m^2]} = \frac{s \cdot w_{[kn/m]} + \Delta g_{[kn/m]} + Qk_{[kn/m]}}{bf_{[m]}}$	סה"כ עומסים	9
הוצאת נתון מטבלאות k12		חישוב k12	10
K11=1	לפי טבלאות K11	חישוב k11	11
עפ"י סוג הבטון - נתון בשאלה ב30 - גירי - 1 ב30 - דולומיטי - 1.04 ב40 - גירי - 1.02 ב40 - דולומיטי - 1.07	נתון בשאלה	חישוב k13	12
$h_{[m]} \geq \frac{\ell_{0max[m]}}{k11 * k12 * k13}$		בדיקת כפף	13
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תכנון קורות בחתך משתנה - תכן ושטחי זיון לדופן לחוצה		
הערה	נוסחאות	שלב
$X \geq tw$	ג. תחום הדופן והאגף לחוצים ואין צורך בזיון לחוץ	
	$Mwd_{[kn*m]} = t_w * b_w * (d - 0.5 * t_w) * fcd_{[kn/cm^2]}$	חישוב מומנט דופן לחוץ
	$Mfd_{[kn*m]} = Md_{[kn*m]} - Mwd_{[kn*m]}$	חישוב מומנט אגף לחוץ
$X = \omega * (d - t_w)$	$\omega = 1 - \left(1 - \frac{2 * Mfd_{[kn*m]}}{bf_{[m]} * (d_{[cm]} - t_{w[cm]}) * fcd_{[kn/cm^2]}} \right)^{0.5}$	3 מציאת תחום לחיצה חדש
	$As_{[cm^2]} = \frac{1}{fsd_{[kn/cm^2]}} * \left[\frac{Mfd_{[kn*m]}}{\left(d - \frac{tw}{2}\right)_m} + \frac{Mwd_{[kn*m]}}{\left(d - \frac{x}{2}\right)_m} \right]$	חישוב שטח זיון מתוח
$X \geq tw$	ד. תחום הדופן והאגף לחוצים ויש צורך בזיון לחוץ	
	$As'_{[cm^2]} = \frac{Md_{[kn*m]} - McdMax_{[kn*m]}}{(d - d'_s)_{[m]} * fsd_{[kn/cm^2]}}$	חישוב שטח לחוץ
	$Mwd_{[kn*m]} = t_w * b_w * (d - 0.5 * t_w) * fcd_{[kn/cm^2]}$	חישוב מומנט דופן לחוץ
	$Mfd_{[kn*m]} = Mcdmax_{[kn*m]} - Mwd_{[kn*m]}$	חישוב מומנט אגף לחוץ
	$\omega = 1 - \left(1 - \frac{2 * Mfd_{[kn*m]}}{bf_{[m]} * (d_{[cm]} - t_{w[cm]}) * fcd_{[kn/cm^2]}} \right)^{0.5}$	4 מציאת תחום לחיצה חדש
	$As_{[cm^2]} = \frac{1}{fsd_{[kn/cm^2]}} * \left[\frac{Mfd_{[kn*m]}}{\left(d - \frac{tw}{2}\right)_m} + \frac{Mwd_{[kn*m]}}{\left(d - \frac{x}{2}\right)_m} + As'_{[cm^2]} \right]$	חישוב שטח זיון מתוח
	$H_{[cm]} = \left(\frac{md_{[kn*m]}}{0.32 * b_{w[m]} * fcd_{[kn/cm^2]}} \right)^{0.5} + ds_{[cm]}$	חישוב גובה נדרש ללא זיון לחוץ
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תכנון קורות בחתך משתנה - תכן ושטחי זיון לדופן לחוצה		
הערה	נוסחאות	שלב
$X \leq tw$	א. תחום הדופן לחוץ ואין צורך בזיון לחוץ	
	$AS_{[cm^2]} = \frac{Md_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{[kn/cm^2]}}$	1 חישוב שטח זיון מתוח
$X \leq tw$	ב. תחום הדופן לחוץ ויש צורך בזיון לחוץ	
	$As'_{[cm^2]} = \frac{Md_{[kn*m]} - McdMax_{[kn*m]}}{(d - d'_s)_{[m]} * fsd_{[kn/cm^2]}}$	חישוב שטח זיון לחוץ
	$As_{[cm^2]} = As'_{act[cm^2]} + \frac{McdMax_{[kn*m]}}{0.8 * d_{[m]} * fsd_{[kn/cm^2]}}$	2 חישוב שטח זיון מתוח
	$H_{[cm]} = \left(\frac{md_{[kn*m]}}{0.32 * b_{[m]} * fcd_{[kn/cm^2]}} \right)^{0.5} + ds_{[cm]}$	חישוב גובה נדרש ללא זיון לחוץ
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תכנון קורות בחתך משתנה - תכן ושטחי זיון לאגף לחוץ		
שלב	נוסחאות	הערה
8	ג. תחום האגף והדופן לחוצים ואין צורך בזיון לחוץ	$X \geq t_f$
	חישוב מומנט אגף לחוץ	$Mfd_{[kn*m]} = (bf - bw)_{cm} * t_{w[cm]} * (d - 0.5 * t_f) * \frac{fcd}{100} \left[\frac{kn}{cm^2} \right]$
	חישוב מומנט דופן לחוץ	$Mwd_{[kn*m]} = Md_{[kn*m]} - Mfd_{[kn*m]}$
	מציאת תחום לחיצה חדש	$\omega = 1 - \left(1 - \frac{2 * Mwd_{[kn*m]}}{bw_{[m]} * (d_{[cm]} - t_{w[cm]}) * fcd \left[\frac{kn}{cm^2} \right]} \right)^{0.5}$
	חישוב שטח זיון מתוח	$As_{[cm^2]} = \frac{1}{fsd \left[\frac{kn}{cm^2} \right]} * \left[\frac{Mfd_{[kn*m]}}{\left(d - \frac{t_f}{2} \right)_m} + \frac{Mwd_{[kn*m]}}{\left(d - \frac{x}{2} \right)_m} \right]$
9	ד. תחום האגף והדופן לחוצים ויש צורך בזיון לחוץ	$X \geq t_f$
	חישוב שטח לחוץ	$As'_{[cm^2]} = \frac{Md_{[kn*m]} - McdMax_{[kn*m]}}{(d - d'_s)_{[m]} * fsd \left[\frac{kn}{cm} \right]}$
	חישוב מומנט דופן לחוץ	$Mfd_{[kn*m]} = t_f * (b_f - b_w) * (d - 0.5 * t_f) * fcd \left[\frac{kn}{cm^2} \right]$
	חישוב מומנט אגף לחוץ	$Mwd_{[kn*m]} = Mcdmax_{[kn*m]} - Mfd_{[kn*m]}$
	מציאת תחום לחיצה חדש	$\omega = 1 - \left(1 - \frac{2 * Mwd_{[kn*m]}}{bw_{[m]} * d_{[cm]}^2 * fcd \left[\frac{kn}{cm^2} \right]} \right)^{0.5}$
	חישוב שטח זיון מתוח	$As_{[cm^2]} = \frac{1}{fsd \left[\frac{kn}{cm^2} \right]} * \left[\frac{Mfd_{[kn*m]}}{\left(d - \frac{t_f}{2} \right)_m} + \frac{Mwd_{[kn*m]}}{\left(d - \frac{x}{2} \right)_m} \right]$
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תכנון קורות בחתך משתנה - תכן ושטחי זיון לאגף לחוץ		
שלב	נוסחאות	הערה
1	חישוב מגבלות שטחי זיון	$ASmin_{[cm^2]} = \rho min * bw_{[cm]} * d_{[cm]}$
2	חישוב יחס חלק לחוץ בחתך - אומנה ω	$\omega = 1 - \left(1 - \frac{2 * Md_{[kn*m]}}{bf_{[m]} * d_{[cm]}^2 * fcd_{[kn]} \left[\frac{kn}{cm^2} \right]} \right)^{0.5}$
3	בדיקת תחום אזור לחוץ	$X = \omega * d$
3	חישוב תסבולת	$McdMax_{[kn*m]} = 0.64 * So_{[cm^3]} * \frac{fcd_{[kn]} \left[\frac{kn}{cm^2} \right]}{100}$
3	חישוב מומנט סטטי (ס"מ)	$So_{[cm^3]} = (bf - bw) * tf * \left(d - \frac{tf}{2} \right) + \left(\frac{bw * d^2}{2} \right)$
4	קביעת מצב תכנון	
5	א. תחום האגף לחוץ ואין צורך בזיון לחוץ	$X \leq t_f$
	ב. תחום האגף לחוץ ויש צורך בזיון לחוץ	$X \leq t_f$
	ג. תחום האגף והדופן לחוצים ואין צורך בזיון לחוץ	$X \geq t_f$
	ד. תחום האגף והדופן לחוצים ויש צורך בזיון לחוץ	$X \geq t_f$
6	א. תחום האגף לחוץ ואין צורך בזיון לחוץ	$X \leq t_f$
	חישוב שטח זיון מתוח	$AS_{[cm^2]} = \frac{Md_{[kn*m]}}{\left(1 - \frac{\omega}{2} \right) * d_{[m]} * fsd_{[kn]} \left[\frac{kn}{cm^2} \right]}$
	ב. תחום האגף לחוץ ויש צורך בזיון לחוץ	$X \leq t_f$
	חישוב שטח זיון לחוץ	$As'_{[cm^2]} = \frac{Md_{[kn*m]} - McdMax_{[kn*m]}}{(d - d'_s)_{[m]} * fsd_{[kn]} \left[\frac{kn}{cm^2} \right]}$
7	חישוב שטח זיון מתוח	$As_{[cm^2]} = As'_{act [cm^2]} + \frac{McdMax_{[kn*m]}}{0.8 * d_{[m]} * fsd_{[kn]} \left[\frac{kn}{cm^2} \right]}$
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תכנון קורות בחתך משתנה – גזירה			
הערה	נוסחאון	שלב	
השענה לא ישירה אין תוספת של d	$Vd_{[kn]} = V_{[kn]} - Fd_{\left[\frac{kn}{m}\right]} * \left(\frac{b}{2} + d_{[m]}\right)$	חישוב כח תכן לגזירה	1
מקדם תיקון גובה	שטח זיון מתוח בחתך	חישוב תסבולת ללא זיון לגזירה	2
$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$	$100\rho = \frac{100 * AS_{[cm^2]}}{b_{[cm]} * d_{[cm]}}$		
$Vrdc = \max \begin{cases} 0.12K (100\rho * 0.7 fck_{\left[\frac{n}{mm^2}\right]})^{\frac{1}{3}} * \frac{bw_{[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck_{\left[\frac{n}{mm^2}\right]})^{0.5} * \frac{bw_{[mm]} * d_{[mm]}}{1000} \end{cases}$			3
חישוב תסבולת לגזירה (זיון מקסימלי)			
$VrdMax = 0.6(1 - 0.7 * \frac{fck_{\left[\frac{n}{mm^2}\right]}}{250}) * \frac{0.9bw_{[mm]} * d_{[mm]} * fcd_{\left[\frac{n}{mm^2}\right]}}{2000}$			4
	$VD \leq VRdc =$ נדרש מינימלי זיון $VD > VRdc =$ נדרש זיון מחושב	קביעת מקרה	
	$St, max = \min \begin{cases} 40_{[cm]} \\ 0.75d_{[cm]} \end{cases}$	חישוב מרחק בין ענפים	5
$C=$ עובי כיסוי בטון	$n = \frac{b_{[cm]} - 2 * C_{[cm]}}{St} + 1$	חישוב כמות ענפים	6
$Sv, max = \min \begin{cases} 30_{[cm]} \\ 0.75d_{[cm]} \\ Sv, min = \frac{Asv_{[cm^2]}}{Pvmin * bw_{[cm]}} \end{cases}$		חישוב פסיעה מקס'	7
$Sv_{[cm]} = \frac{0.9 * d_{[cm]} * Asv_{[cm^2]} * fsd_{\left[\frac{kn}{cm^2}\right]}}{Vd_{[kn]}}$		חישוב פסיעה לפי קוטר נתון	8
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תכנון תקרת צלעות מתוחה בכיוון אחד – שטחי זיון למומנטים חיוביים		
הערה	נוסחאות	שלב
	$AS_{min[cm^2]} = \rho_{min} * bw_{[cm]} * d_{[cm]}$ $AS_{max[cm^2]} = \rho_{max} * bw_{[cm]} * d_{[cm]}$	1 חישוב מגבלות שטחי זיון
$\omega_{min} = 0.1$ $\omega_{max} = 0.4$	$\omega = 1 - \left(1 - \frac{2 * Md_{[kn*m]}}{bf_{[m]} * d_{[cm]}^2 * fcd_{[cm^2]}} \right)^{0.5}$	2 חישוב יחס חלק לחוץ בחתך – אומגה ω
	$X = \omega * d$	3 בדיקת גודל תחום לחוץ
	$AS_{[cm^2]} = \frac{Md_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{[cm^2]}}$	4 $X \leq tf$ בחירת שטח זיון דרוש
	$McdMax_{[kn*m]} = 0.64 * S_{0[cm^3]} * \frac{fcd_{[kn/cm^2]}}{100}$	$X \geq tf$ חישוב תסבולת
	$Mfd_{[kn*m]} = (bf - bw)_{cm} * t_{f[cm]} * (d - 0.5 * t_f) * \frac{fcd_{[kn/cm^2]}}{100}$	חישוב מומנט אגף לחוץ
	$Mwd_{[kn*m]} = Md_{[kn*m]} - Mfd_{[kn*m]}$	חישוב מומנט דופן לחוץ
	$\omega = 1 - \left(1 - \frac{2 * Mwd_{[kn*m]}}{bw_{[m]} * (d_{[cm]} - t_{w[cm]}) * fcd_{[kn/cm^2]}} \right)^{0.5}$	5 מציאת תחום לחיצה חדש
	$AS_{[cm^2]} = \frac{1}{fsd_{[cm^2]}} * \left[\frac{Mfd_{[kn*m]}}{\left(d - \frac{tf}{2}\right)_m} + \frac{Mwd_{[kn*m]}}{\left(d - \frac{x}{2}\right)_m} \right]$	חישוב שטח זיון מתוח
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תכנון תקרת צלעות מתוחה בכיוון אחד - בדיקת כפף		
הערה	נוסחאות	שלב
		1 שרטוט כל הסכמות בתקרה
		2 חישוב מפתחים שקילים וקביעת מפתח שקיל מקסימלי
	$\frac{S.W_{[kn/m^2]} = 25 \left(\text{שטח בטון} \right) + \gamma}{bf_{[m]}}$	3 חישוב משקל עצמי
	$F_{ser[kn/m^2]} = s.w_{[kn/m^2]} + \Delta g_{[kn/m^2]} + Qk_{[kn/m^2]}$	4 חישוב K11
	$h_{[m]} \geq \frac{\ell_{0max[m]}}{k11 * k12 * k13}$	5 חישוב K12
	נתון בסעיף השאלה עפ"י סוג הבטון - נתון בשאלה 30 - גירי - 1 30 - דולומיטי - 1.04 40 - גירי - 1.02 40 - דולומיטי - 1.07	7 חישוב K13
		8 בדיקת כפף
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תכנון תקרת צלעות מתוחה בכיוון אחד - עומסי תכן ומצבי עמיסה		
הערה	נוסחאות	שלב
$Gk = s.w + \Delta g$	$Fd_{max} = 1.6Qk_{[kn/m^2]} + 1.4Gk_{[kn/m^2]}$ $Fd_{min} = 1.2Gk_{[kn/m^2]}$	1 חישוב עומסי תכן לתקרה
ז"ז	$Fd_{min} = Gk_{[kn/m^2]}$	
	$Fd_{max[kn/m]} = Fd_{max[kn/m^2]} * bf_{[m]}$	2 חישוב עומסי תכן לצלע
	$Fd_{min[kn/m]} = Fd_{min[kn/m^2]} * bf_{[m]}$	
	במידה ונדרש לשרטט מצבי עמיסה מסוכנים	3 חישוב ושרטוט מצבי העמסה
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תכנון קורה סמויה - קביעת רוחב קורה

הערה	נוסחאון	שלב	
		סרטוט סכמת הקורה	1
		קביעת מפתח שקיל רלוונטי	2
יש להוסיף משקל עצמי בהתאם	$Fser(\frac{kn}{m})$ - העברת עומסים	חישוב עומסים הפועלים על הקורה	3
הוצאת FSER מהטבלה	$K12 = \frac{\ell_0[m]}{h_{[m]} * k11 * k13}$	חישוב K12	4
	$b_{(m)} = \frac{Fser(\frac{kn}{m})}{Fser(\frac{kn}{m^2})}$	חישוב רוחב קורה	5

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תכנון תקרת צלעות מתוחה בכיוון אחד - שטחי זיון למומנטים שליליים

הערה	נוסחאון	שלב	
$bt_{[cm]} = \frac{bf + bw}{2}$	$ASmin_{[cm^2]} = \rho min * bt_{[cm]} * d_{[cm]}$	חישוב מגבלות שטחי זיון	1
$\omega min = 0.1$ $\omega max = 0.4$	$\omega = 1 - \left(1 - \frac{2Md_{[kn*m]}}{bw_{[m]} * d_{[cm]}^2 * fcd_{[\frac{kn}{cm^2}]}}\right)^{0.5}$	חישוב יחס חלק לחוץ בחתך - אומגה ω	2
	$AS_{[cm^2]} = \frac{Md_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fcd_{[\frac{kn}{cm^2}]}}$	חישוב שטח זיון מתוח	3

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תכנון תקרת צלעות מתוחה בכיוון אחד - סיבוב בלוק

הערה	נוסחאון	שלב	
	$McdMax_{[kn*m]} = 0.32 * bw_{[m]} * d^2[cm] * fcd_{[\frac{kn}{cm^2}]}$	חישוב תסבולת החתך	1

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תכנון תקרה מקשית מצולבת - תכן ושטחי זיון

הערה	נוסחאון	שלב
$Gk = s.w + \Delta g$	$Fdmax = 1.6Qk_{\left[\frac{kn}{m^2}\right]} + 1.4Gk_{\left[\frac{kn}{m^2}\right]}$	1 חישוב עומסי תכן לתקרה
	$Fdmin = 1.2Gk_{\left[\frac{kn}{m^2}\right]}$	
ז"ז	$Fdmin = Gk_{\left[\frac{kn}{m^2}\right]}$	
	מומנט שלילי סופי יחושב ע"י סכום 2 מומנטים שליליים וממוצע ביניהם בהתאם לשדה הרלוונטי	2 חישוב מומנטים שליליים
התחשבות במצבי עמיסה	התחשבות במצבי עמיסה מסוכנים	3 חישוב מומנטים חיוביים
$F'_{\left[\frac{kn}{m^2}\right]} = Fdmax$	$F'_{\left[\frac{kn}{m^2}\right]} = \frac{Fdmax + Fdmin}{2}$	
	$F''_{\left[\frac{kn}{m^2}\right]} = \frac{Fdmax - Fdmin}{2}$	
$b=100cm$	$ASmin_{[cm^2]} = \rho min * b_{[cm]} * d_{[cm]}$	4 חישוב מגבלות שטחי זיון
$\omega min = 0.1$ $\omega max = 0.4$	$\omega = 1 - \left(1 - \frac{2 * Md_{[kn*m]}}{b_{[m]} * d_{[cm]}^2 * fcd_{\left[\frac{kn}{cm^2}\right]}}\right)^{0.5}$	5 חישוב יחס חלק לחוץ בחתך - אומגה ω
	$AS_{[cm^2]} = \frac{Md_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{\left[\frac{kn}{cm^2}\right]}}$	6 בחירת שטח זיון דרוש
	לפי טבלאות	7 בחירת ברזל

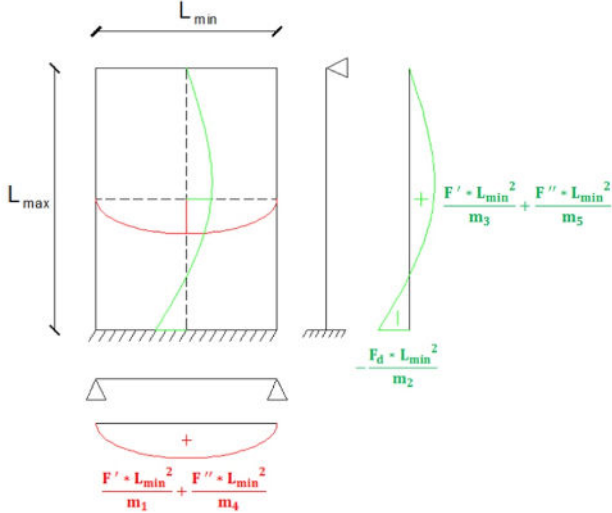
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תכנון תקרה מקשית מצולבת - בדיקת כפף

תכנון תקרה מקשית מצולבת - בדיקת כפף			
הערה	נוסחאון		שלב
שרטוט כל הסכמות בתקרה			1
$\frac{Lmax}{Lmin} < 1.15$	$1.15 \leq \frac{Lmax}{Lmin} \leq 2$	$\frac{Lmax}{Lmin} > 2$	קביעת מפתחים לכל שדה
מצולבת "ריבועית"	מצולבת "מלבנית"	תקרה מקשית חד-כיוונית	קביעת סוג תקרה
$L_0 = \frac{L_{0x} + L_{0y}}{2}$	$L_0 = \min \left\{ L_{0x} \atop L_{0y} \right\}$	$L_0 = L_0 \max$	מפתח שקיל קובע
$K11 = \frac{1.22}{\sqrt[3]{\frac{Lmax}{Lmin}}}$		$K11 = 1$	חישוב K11
עבור תקרה מצולבת		עבור תקרה מקשית	הנחת גובה משוער
$H_{משוער} = \frac{\lambda * \ell_{0(קובע)}}{30}$		$H_{משוער} = \frac{\ell_{0(max)}}{25}$	
$\lambda = \sqrt[3]{\frac{Lmax}{Lmin}}$			
	$s.w_{\left[\frac{kn}{m^2}\right]} = 25_{\left[\frac{kn}{m^3}\right]} * h_{[m]}$		חישוב עומסי שירות
	$\Delta g_{\left[\frac{kn}{m^2}\right]}$		משקל עצמי של התקרה
	$Qk_{\left[\frac{kn}{m^2}\right]}$		עומס קבוע נוסף
	$Fser_{\left[\frac{kn}{m^2}\right]} = s.w_{\left[\frac{kn}{m^2}\right]} + \Delta g_{\left[\frac{kn}{m^2}\right]} + Qk_{\left[\frac{kn}{m^2}\right]}$		עומס שימושי
	הוצאת נתון מטבלאות k12		סה"כ עומסים
	K12		חישוב K12
עפ"י סוג הבטון - נתון בשאלה בסוג - גירי - 1 בסוג - דולומיטי - 1.04 בסוג - גירי - 1.02 בסוג - דולומיטי - 1.07	נתון בסעיף השאלה		חישוב K13
	$h_{[m]} \geq \frac{\ell_{0max[m]}}{k11 * k12 * k13}$		בדיקת כפף
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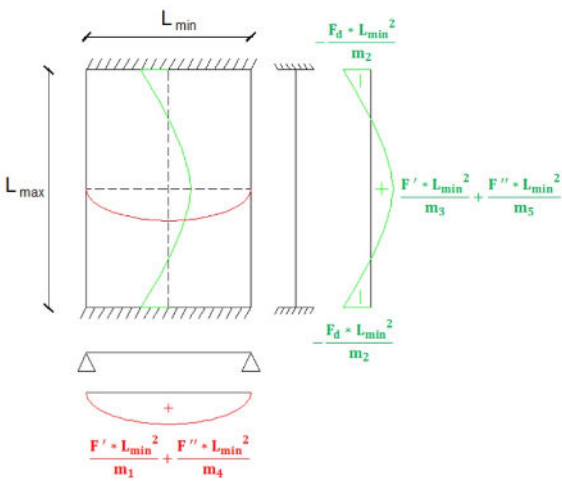
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מקרה 2 - שדה עם שלוש שפות חופשיות וריתום בשפה הקצרה



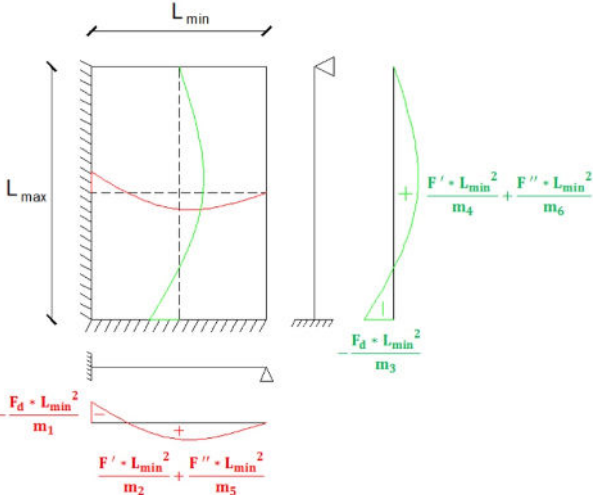
l_{max}/l_{min}	m_1	m_2	m_3	m_4	m_5
1	41.2	11.9	29.4	27.2	27.2
1.05	36.5	11.3	29	24.5	27.5
1.1	31.9	10.9	28.8	22.4	27.9
1.15	28.3	10.4	28.8	20.7	28.4
1.2	25.9	10.1	28.9	19.1	29.1
1.25	23.4	9.8	29.2	17.8	29.9
1.3	21.7	9.6	29.7	16.8	30.9
1.35	20.1	9.3	30.2	15.8	31.8
1.4	18.8	9.2	30.8	15	32.8
1.45	17.5	9	31.6	14.3	33.8
1.5	16.6	8.9	32.3	13.7	34.7
1.55	15.7	8.8	33	13.2	35.4
1.6	15	8.7	33.6	12.7	36.1
1.65	14.3	8.6	34.3	12.3	36.7
1.7	13.8	8.5	34.9	11.9	37.3
1.75	13.2	8.45	35.6	11.5	37.9
1.8	12.8	8.4	36.2	11.3	38.5
1.85	12.3	8.35	36.9	11	38.9
1.9	12	8.3	37.5	10.8	39.4
1.95	11.6	8.25	38.2	10.6	39.8
2	11.4	8.2	38.8	10.4	40.3

מקרה 4 - שדה עם שתי שפות חופשיות וריתום בשתי השפות הקצרות



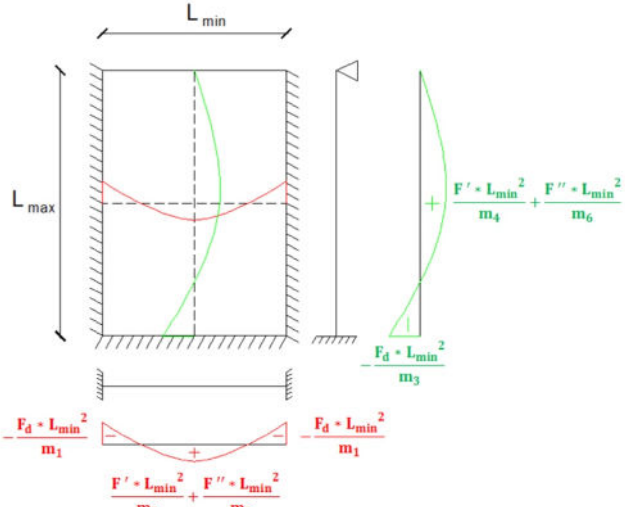
l_{max}/l_{min}	m_1	m_2	m_3	m_4	m_5
1	61.7	14.3	35.1	27.2	27.2
1.05	52.2	13.4	33.7	24.5	27.5
1.1	46.1	12.7	32.9	22.4	27.9
1.15	39.8	12	32.2	20.7	28.4
1.2	35.5	11.5	31.7	19.1	29.1
1.25	31.5	11.1	31.3	17.8	29.9
1.3	28.5	10.7	31.2	16.8	30.9
1.35	25.8	10.3	31.2	15.8	31.8
1.4	23.7	10	31.4	15	32.8
1.45	22	9.75	31.7	14.3	33.8
1.5	20.4	9.5	32.1	13.7	34.7
1.55	19	9.3	32.7	13.2	35.4
1.6	17.9	9.2	33.3	12.7	36.1
1.65	16.9	9.05	34	12.3	36.7
1.7	16	8.9	34.9	11.9	37.3
1.75	15.2	8.8	35.9	11.5	37.9
1.8	14.6	8.7	37.1	11.3	38.5
1.85	13.9	8.6	38.3	11	38.9
1.9	13.4	8.5	39.7	10.8	39.4
1.95	12.9	8.4	41.1	10.6	39.8
2	12.5	8.4	42.4	10.4	40.3

מקרה 6 - שדה עם שתי שפות חופשיות וריתום בשפה קצרה ובשפה ארוכה



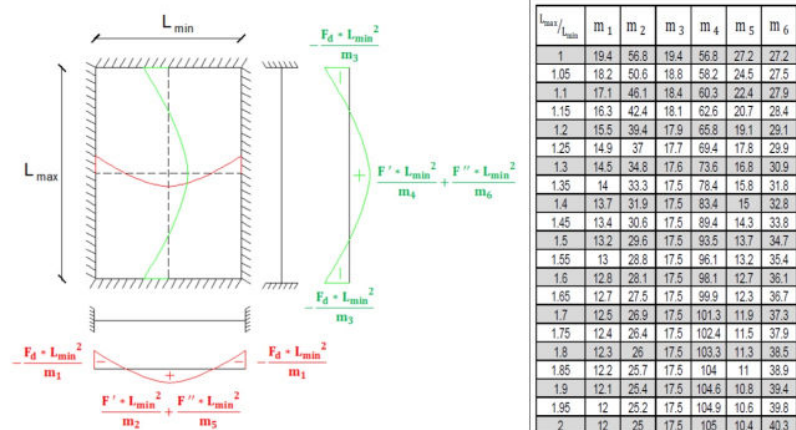
l_{max}/l_{min}	m_1	m_2	m_3	m_4	m_5	m_6
1	14.3	40.2	14.3	40.2	27.2	27.2
1.05	13.3	38	13.8	41	24.5	27.5
1.1	12.7	35.1	13.6	42	22.4	27.9
1.15	12	32.2	13.3	42.09	20.7	28.4
1.2	11.5	30	13.1	44	19.1	29.1
1.25	11.1	28	12.9	45.6	17.8	29.9
1.3	10.7	26.5	12.8	47.6	16.8	30.9
1.35	10.3	25.2	12.7	49.6	15.8	31.8
1.4	10	24.1	12.6	51	15	32.8
1.45	9.8	23.1	12.5	52.1	14.3	33.8
1.5	9.6	22.2	12.4	53	13.7	34.7
1.55	9.4	21.6	12.3	54.1	13.2	35.4
1.6	9.2	21	12.3	54.8	12.7	36.1
1.65	9.1	20.4	12.2	55.6	12.3	36.7
1.7	8.9	19.9	12.2	56.3	11.9	37.3
1.75	8.8	19.5	12.2	57	11.5	37.9
1.8	8.7	19.1	12.2	57.7	11.3	38.5
1.85	8.6	18.7	12.2	58.3	11	38.9
1.9	8.5	18.4	12.2	59	10.8	39.4
1.95	8.1	18.1	12.2	59.6	10.6	39.8
2	8.4	17.9	12.2	60.2	10.4	40.3

מקרה 8 - שדה עם שפה חופשית בצד הקצר וריתום בשאר השפות



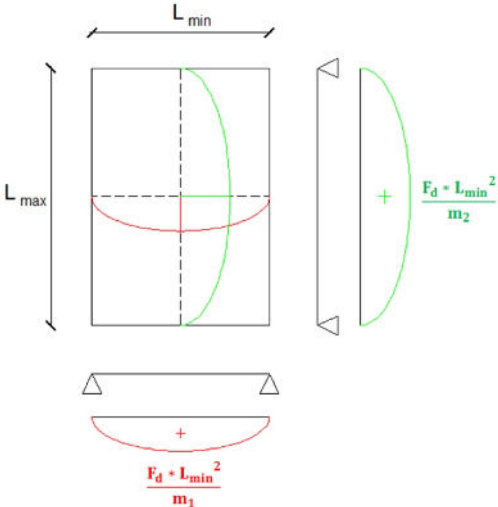
l_{max}/l_{min}	m_1	m_2	m_3	m_4	m_5	m_6
1	16.2	44.1	18.3	55.9	27.2	27.2
1.05	15.3	40.5	17.9	57.5	24.5	27.5
1.1	14.8	37.9	17.7	60.3	22.4	27.9
1.15	14.2	35.5	17.6	64.2	20.7	28.4
1.2	13.9	33.8	17.5	66.2	19.1	29.1
1.25	13.5	32.3	17.5	67.7	17.8	29.9
1.3	13.2	31	17.5	69	16.8	30.9
1.35	12.9	29.9	17.5	70.5	15.8	31.8
1.4	12.7	29	17.5	72	15	32.8
1.45	12.6	28.2	17.5	73.4	14.3	33.8
1.5	12.5	27.6	17.5	75.2	13.7	34.7
1.55	12.4	27	17.5	76.9	13.2	35.4
1.6	12.3	26.5	17.5	78.7	12.7	36.1
1.65	12.2	26.1	17.5	80.5	12.3	36.7
1.7	12.2	25.7	17.5	82.5	11.9	37.3
1.75	12.1	25.3	17.5	84.6	11.5	37.9
1.8	12.1	25.1	17.5	86.8	11.3	38.5
1.85	12	24.9	17.5	89.2	11	38.9
1.9	12	24.7	17.5	91.7	10.8	39.4
1.95	12	24.6	17.5	94.3	10.6	39.8
2	12	24.5	17.5	97	10.4	40.3

מקרה 9 - ריתום בכל השפות



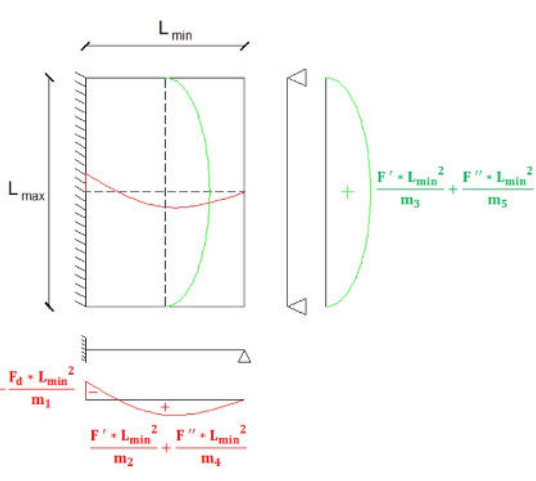
l_{max}/l_{min}	m_1	m_2	m_3	m_4	m_5	m_6
1	19.4	56.8	19.4	56.8	27.2	27.2
1.05	18.2	50.6	18.8	58.2	24.5	27.5
1.1	17.1	46.1	18.4	60.3	22.4	27.9
1.15	16.3	42.4	18.1	62.6	20.7	28.4
1.2	15.5	39.4	17.9	65.8	19.1	29.1
1.25	14.9	37	17.7	69.4	17.8	29.9
1.3	14.5	34.8	17.6	73.6	16.8	30.9
1.35	14	33.3	17.5	78.4	15.8	31.8
1.4	13.7	31.9	17.5	83.4	15	32.8
1.45	13.4	30.6	17.5	89.4	14.3	33.8
1.5	13.2	29.6	17.5	93.5	13.7	34.7
1.55	13	28.8	17.5	96.1	13.2	35.4
1.6	12.8	28.1	17.5	98.1	12.7	36.1
1.65	12.7	27.5	17.5	99.9	12.3	36.7
1.7	12.5	26.9	17.5	101.3	11.9	37.3
1.75	12.4	26.4	17.5	102.4	11.5	37.9
1.8	12.3	26	17.5	103.3	11.3	38.5
1.85	12.2	25.7	17.5	104	11	38.9
1.9	12.1	25.4	17.5	104.6	10.8	39.4
1.95	12	25.2	17.5	104.9	10.6	39.8
2	12	25	17.5	105	10.4	40.3

מקרה 1 - שדה עם ארבע שפות חופשיות



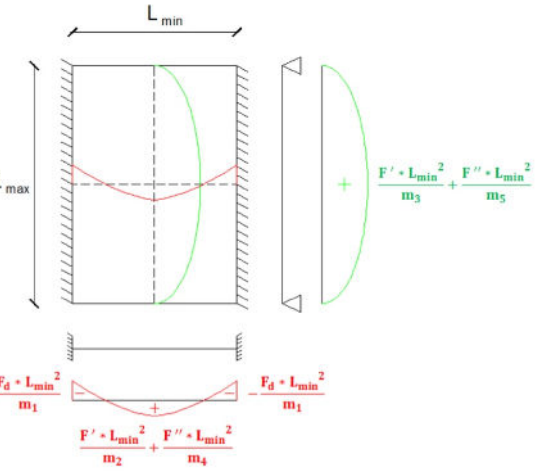
l_{max}/l_{min}	m_1	m_2
1	27.2	27.2
1.05	24.5	27.5
1.1	22.4	27.9
1.15	20.7	28.4
1.2	19.1	29.1
1.25	17.8	29.9
1.3	16.8	30.9
1.35	15.8	31.8
1.4	15	32.8
1.45	14.3	33.8
1.5	13.7	34.7
1.55	13.2	35.4
1.6	12.7	36.1
1.65	12.3	36.7
1.7	11.9	37.3
1.75	11.5	37.9
1.8	11.3	38.5
1.85	11	38.9
1.9	10.8	39.4
1.95	10.6	39.8
2	10.4	40.3

מקרה 3 - שדה עם שלוש שפות חופשיות וריתום בשפה הארוכה



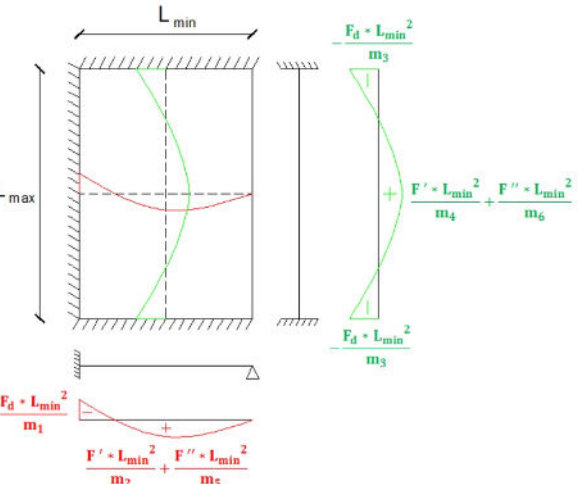
l_{max}/l_{min}	m_1	m_2	m_3	m_4	m_5
1	11.9	29.4	41.2	27.2	27.2
1.05	11.3	29.2	43.2	24.5	27.5
1.1	10.9	27.3	45.1	22.4	27.9
1.15	10.5	25.8	47.1	20.7	28.4
1.2	10.2	24.5	48.8	19.1	29.1
1.25	9.9	23.4	50.3	17.8	29.9
1.3	9.7	22.4	51.8	16.8	30.9
1.35	9.4	21.6	53.2	15.8	31.8
1.4	9.3	21	54.3	15	32.8
1.45	9.1	20.3	55	14.3	33.8
1.5	9	19.8	55.6	13.7	34.7
1.55	8.9	19.4	56.2	13.2	35.4
1.6	8.8	19	56.8	12.7	36.1
1.65	8.7	18.6	57.3	12.3	36.7
1.7	8.6	18.3	57.8	11.9	37.3
1.75	8.5	18	58.2	11.5	37.9
1.8	8.4	17.8	58.6	11.3	38.5
1.85	8.3	17.5	58.8	11	38.9
1.9	8.3	17.4	59	10.8	39.4
1.95	8.3	17.2	59.1	10.6	39.8
2	8.3	17.1	59.2	10.4	40.3

מקרה 5 - שדה עם שתי שפות חופשיות וריתום בשתי השפות הארוכות



l_{max}/l_{min}	m_1	m_2	m_3	m_4	m_5
1	14.3	35.1	61.7	27.2	27.2
1.05	13.8	33	64.5	24.5	27.5
1.1	13.5	31.7	67.2	22.4	27.9
1.15	13.2	30.4	69.6	20.7	28.4
1.2	13	29.4	71.5	19.1	29.1
1.25	12.7	28.5	72.8	17.8	29.9
1.3	12.6	27.8	73.5	16.8	30.9
1.35	12.4	27.1	74.1	15.8	31.8
1.4	12.3	26.6	74.6	15	32.8
1.45	12.2	26.1	75.3	14.3	33.8
1.5	12.2	25.8	75.8	13.7	34.7
1.55	12.1	25.4	76.5	13.2	35.4
1.6	12	25.2	77	12.7	36.1
1.65	12	24.9	77	12.3	36.7
1.7	12	24.7	77	11.9	37.3
1.75	12	24.5	77	11.5	37.9
1.8	12	24.4	77	11.3	38.5
1.85	12	24.3	77	11	38.9
1.9	12	24.3	77	10.8	39.4
1.95	12	24.2	77	10.6	39.8
2	12	24.1	77	10.4	40.3

מקרה 7 - שדה עם שפה חופשית בצד הארוך וריתום בשאר השפות

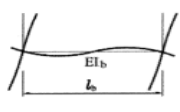
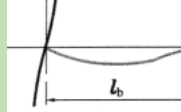


L_{max}/L_{min}	m_1	m_2	m_3	m_4	m_5	m_6
1	18.3	55.9	16.2	44.1	27.2	27.2
1.05	16.6	51.6	15.4	43.6	24.5	27.5
1.1	15.4	46.1	14.8	43.7	22.4	27.9
1.15	14.4	41.4	14.3	44.2	20.7	28.4
1.2	13.5	37.5	13.9	44.8	19.1	29.1
1.25	12.7	34.2	13.5	45.8	17.8	29.9
1.3	12.2	31.8	13.3	46.9	16.8	30.9
1.35	11.6	29.6	13.1	48.6	15.8	31.8
1.4	11.2	28	13	50.3	15	32.8
1.45	10.9	26.4	12.8	52.3	14.3	33.8
1.5	10.6	25.2	12.7	55	13.7	34.7
1.55	10.3	24.2	12.6	58.2	13.2	35.4
1.6	10.1	23.3	12.6	61.6	12.7	36.1
1.65	9.9	22.5	12.5	65.6	12.3	36.7
1.7	9.7	21.7	12.5	70.4	11.9	37.3
1.75	9.5	21.1	12.4	75	11.5	37.9
1.8	9.4	20.5	12.4	79.6	11.3	38.5
1.85	9.2	20	12.3	84.7	11	38.9
1.9	9	19.5	12.3	89.8	10.8	39.4
1.95	8.9	19.1	12.3	95.4	10.6	39.8
2	8.8	18.7	12.2	101	10.4	40.1

תכנון עמודים - חישוב תמירות ואורך פעיל

הערה	נוסחאות	שלב
		1
		המשך חישוב אורך פעיל
יחס קשיחות צומת במידה ואין נתונים	קצה חופשי	חיבור פרקי
	$\alpha = \infty$	$\alpha = 10$
		חיבור רתום
		$\alpha = 0.1$
	מסגרת לא מוחזקת	מסגרת מוחזקת
2		
$Le_{[cm]} = \max \left\{ \begin{array}{l} Lc * \left(1 + 10 * \frac{\alpha_u * \alpha_d}{\alpha_u + \alpha_d} \right)^{0.5} \\ Lc * \left(1 + \frac{\alpha_u}{1 + \alpha_u} \right) * \left(1 + \frac{\alpha_d}{1 + \alpha_d} \right) \end{array} \right.$ $Le_{[cm]} = 0.5Lc \left[\left(1 + \frac{\alpha_u}{0.45 + \alpha_u} \right) * \left(1 + \frac{\alpha_d}{0.45 + \alpha_d} \right) \right]^{0.5}$		
כאשר יחס צמתים שווה		
$Le_{[cm]} = Lc_{[cm]} * \max \left\{ \begin{array}{l} \sqrt{(1 + 5 * \alpha)} \\ \left(\frac{1 + 2 * \alpha}{1 + \alpha} \right)^2 \end{array} \right.$ $Le_{[cm]} = 0.5 * Lc_{[cm]} * \left(1 + \frac{\alpha}{0.45 + \alpha} \right)$		
3	חישוב תמירות עמוד בפועל	של הכיוון הנבדק
	$\lambda = \frac{Le_{[cm]} * \sqrt{12}}{h_{[cm]}}$	

תכנון עמודים - חישוב תמירות ואורך פעיל

הערה	נוסחאות	שלב
		1
$\lambda_{min} \leq 100$ אם לא נתון להניח $A=0.7$ אם לא נתון להניח $B=1.1$ אם לא נתון להניח $C=0.7$ שטח עמוד S	$\lambda_{min} = \frac{20 * A * B * C}{\sqrt{\frac{Nd_{[kn]}}{S_{[cm^2]} * fcd_{[kn/cm^2]}}}}$	חישוב תמירות גבולית
		3
כיוון נבדק		חישוב אורך פעיל בציר Y / X
	$I_{cr, c_{[cm^4]}} = 0.7 * \frac{b_{[cm]} * h_{[cm]}^3}{12}$	חישוב אינרציה עבור עמודים המחוברים לצומת
אורך עמוד Lc	$\sum c = \frac{I_{cr, c_{[cm^4]}}}{Lc_{[cm]}}$	חישוב קשיחות סופית בצומת
	$I_{cr, b_{[cm^4]}} = 0.35 * \frac{b_{[cm]} * h_{[cm]}^3}{12}$	חישוב אינרציה עבור קורות המחוברים לצומת
אורך קורה Lb מקדם השענה k	$\sum b = k * \frac{I_{cr, b_{[cm^4]}}}{Lb_{[cm]}}$	חישוב קשיחות סופית בצומת
מסגרת שאינה מוחזקת	מסגרת מוחזקת	
K=6	K=4	K=3
K=2		
		
		
		8
כל צומת נדרשת בבדיקה נפרדת	$\alpha = \frac{\sum c}{\sum b}$	חישוב יחס קשיחות לצומת הנבדק

תכנון עמודים - שטחי זיון באקסצנטריות גדולה

הערה	נוסחאון	שלב	
	$McdMax_{[kn*m]} = 0.32 * b_{[m]} * d^2_{[cm]} * fcd_{[kn/cm^2]}$	חישוב תסבולת החתך	1
	$Msd_{[kn*m]} = Nd_{[kn]} * (\Delta e_{[m]} + 0.5 * h_{[m]} - d_{s[m]})$	חישוב מומנט התכן	2
$McdMax \geq Msd$ נדרש זיון לחיצה מינימלי	$McdMax < Msd$ נדרש זיון לחיצה מחושב	קביעת מצב זיון נדרש	3
$As \min_{[cm^2]} = As' \min_{[cm^2]} = \rho' * b_{[cm]} * d_{[cm]}$ פאה אחת $\rho=0.002$ צד אחד $\rho=0.004$ חתך העמוד $\rho=0.008$		חישוב שטח זיון מינימלי	4
$\Delta M_{kn*m} = As' \min_{[cm^2]} * fsd_{[kn/cm^2]} * (d_m - ds'_m)$	$\Delta M_{kn*m} = Msd_{kn*m} - Mcdmax_{kn*m}$	השלמת מומנט זיון לחוץ	5
$As' \min_{[cm^2]}$	$As'_{cm^2} = \frac{\Delta M_{kn*m}}{(d_m - ds'_m) * fsd_{[kn/cm^2]}} \geq As' \min$	חישוב שטח זיון לחוץ	6
$As_{cm^2} = As' \min + \frac{Msd - \Delta M}{(d_m - ds'_m) * fsd_{[kn/cm^2]}} - \frac{Nd_{kn}}{fsd_{[kn/cm^2]}} \geq As' \min$	$As_{cm^2} = As' act + \frac{McdMax_{kn*m}}{0.8 * d_m * fsd_{[kn/cm^2]}} - \frac{Nd_{kn}}{fsd_{[kn/cm^2]}} \geq As' \min$	חישוב שטח זיון מתוח	7

תכנון עמודים - חישובי אקסצנטריות

הערה	נוסחאון	שלב	
Md= מומנט נתון בהתאם לכיוון הנבדק	$ed_{[cm]} = \max \left\{ \frac{Md_{[kn*m]} * 100}{Nd_{[kn]}}, \frac{2cm}{h_{[cm]}}, \frac{h_{[cm]}}{30} \right\}$	אקסצנטריות תכנונית ed	1
		אקסצנטריות אי דיוקים בביצוע	
L = מידה צירית של העמוד	$\alpha_h \min = \frac{2}{3} \leq \frac{2}{\sqrt{L_{[m]}}} \leq 1 \max$	חישוב מקדם הפחתה	1
	$ei_{[cm]} = \frac{0.5 * \alpha_h * Le_{[cm]}}{200}$	חישוב אקסצנטריות ei	2
C= מקדם אינטגרציה C=10 מומנט משתנה C=8 מומנט קבוע	$e2_{[cm]} = K_r * K_\phi * \frac{fsd_{[kn/cm^2]} * Le^2_{[cm]}}{0.45 * Es * d_{[cm]} * C}$ $Es = 2 * 10^4$	חישוב אקסצנטריות תמירות e2	3
	$\Delta e_{[cm]} = e2_{[cm]} + ei_{[cm]} + ed_{[cm]}$	חישוב אקסצנטריות כוללת	4
	$y = 0.5 * h - d_s$		
	$\Delta e > y$ אקסנטריות גדולה $\Delta e \leq y$ אקסנטריות קטנה		

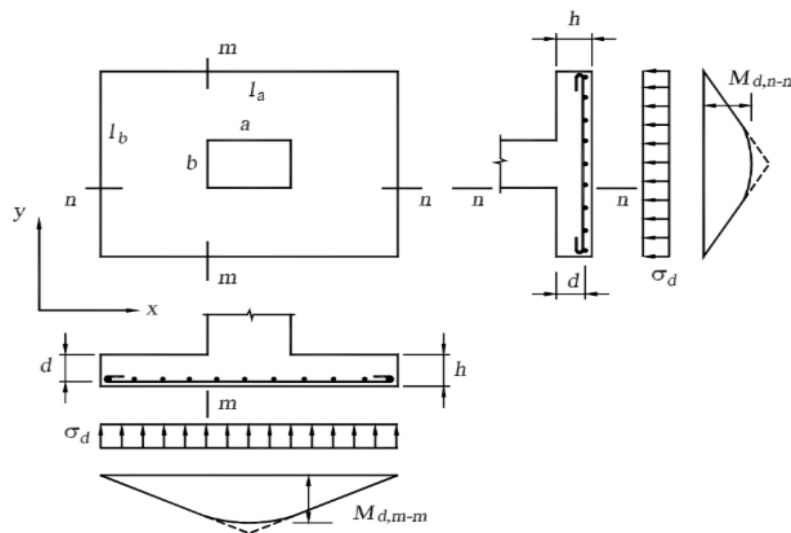


תכנון עמודים - שטחי זיון באקסצנטריות קטנה			
שלב	נוסחאון		הערה
1	$McdMax_{[kn*m]} = 0.32 * b_{[m]} * d^2[cm] * fcd_{[\frac{kn}{cm^2}]}$		חישוב תסבולת החתר
2	$Msd_{[kn*m]} = Nd_{[kn]} * (\Delta e_{[m]} + 0.5 * h_{[m]} - d_{s[m]})$		חישוב מומנט התכן
3	קביעת מצב זיון נדרש	$McdMax < Msd$ נדרש זיון לחיצה מחושב	$McdMax \geq Msd$ נדרש זיון לחיצה מינימלי
4	$As\ min_{[cm^2]} = As'\ min_{[cm^2]} = \rho' * b_{[cm]} * d_{[cm]}$ פאה אחת $\rho=0.002$ צד אחד $\rho=0.004$ חתך העמוד $\rho=0.008$		חישוב שטח זיון מינימלי
5	$\Delta M_{kn*m} = Msd_{kn*m} - Mcdmax_{kn*m}$		השלמת מומנט זיון לחוץ
6	$As'\ min$	$As'\ cm^2 = \frac{\Delta M_{kn*m}}{(d_m - ds'_m) * fsd_{[\frac{kn}{cm^2}]}} \geq As'\ min$	חישוב שטח זיון לחוץ
7	$As'\ min$	$As_{cm^2} = As'act + \frac{McdMax_{kn*m}}{0.8 * d_m * fsd_{[\frac{kn}{cm^2}]}} - \frac{Nd_{kn}}{fsd_{[\frac{kn}{cm^2}]}} \geq As'\ min$	חישוב שטח זיון מתוח
8	בהנחה ושטח הזיון קטן מאפס		
	$Msd'_{kn*m} = Nd_{kn} * (0.5 * h_m - \Delta e_m - ds_m)$		חישוב מומנט התכן בברזל הלחוץ
	$Msd' < Mcdmax$	$Msd' > Mcdmax$	קביעת מצב
	$As = As'\ min$	$As_{cm^2} = \frac{\Delta M_{kn*m}}{(d_m - ds'_m) * fsd_{[\frac{kn}{cm^2}]}} \geq As'\ min$	חישוב שטח זיון מתוח

שטחי זיון היסוד

הערה	נוסחאון	שלב	
	$ASmin_{[cm^2]} = 0.002 * lb_{[cm]} * d_{[cm]}$	כיוון la	1
	$ASmin_{[cm^2]} = 0.002 * la_{[cm]} * d_{[cm]}$	כיוון lb	
	$\omega = 1 - \left(1 - \frac{2 * Md_{[kn*m]} * la_{[kn*m]}}{lb_{[m]} * d_{[cm]}^2 * fcd_{[cm^2]}}\right)^{0.5}$	כיוון la	2
	$\omega = 1 - \left(1 - \frac{2 * Md_{[kn*m]} * ly_{[kn*m]}}{la_{[m]} * d_{[cm]}^2 * fcd_{[cm^2]}}\right)^{0.5}$	כיוון lb	
	$AS_{la_{[cm^2]}} = \frac{Md_{[kn*m]} * la_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{[cm^2]}}$	כיוון la	3
	$AS_{lb_{[cm^2]}} = \frac{Md_{[kn*m]} * lb_{[kn*m]}}{\left(1 - \frac{\omega}{2}\right) * d_{[m]} * fsd_{[cm^2]}}$	כיוון lb	
קביעת הברזל תעשה לפי אורך היסוד ולא לפי רצועה של 100 ס"מ לצורך קביעת הברזל יש לחשב לפי 100 ס"מ - טבלת זיון ראשי $ASmin_{[cm^2]} = 0.002 * 100_{[cm]} * d_{[cm]}$		בחירת ברזל $n \Phi @$	4

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תכנון יסודות

הערה	נוסחאון	שלב	
	$Nser_{[kn]} = \Delta g_{[kn]} + Qk_{[kn]}$	מציאת שטח יסוד דרוש	1
	$A_{[m^2]} = \frac{Nser_{[kn]}}{\sigma}$	שטח יסוד לפי המאמץ המותר בקרקע	2
	$\sqrt{A_{[m^2]}} = la_{[m]} = lb_{[m]}$	חישוב מידות היסוד	3
הגדרת $la \setminus lb$	$\sigma_{act_{[m^2]}_{[kn]}} = \frac{Nser_{[kn]}}{la * lb_{[m]}}$	חישוב מאמץ בקרקע	4
$Nd = 1.45 Nser$	$Nd_{[kn]} = 1.6Qk_{[kn]} + 1.4\Delta g_{[kn]}$	חישוב עומס תכן	5
	$\sigma d_{[m^2]}_{[kn]} = \frac{Nd_{[kn]}}{la * lb_{[m]}}$	חישוב מאמץ תכן	6
		שרטוט סכמות ומהלכי כוחות	7
חישובי מהלכים			
	$Q = \sigma d * lb * 0.5la$	כיוון la	8
	$Q = \sigma d * 0.5lb * la$	כיוון lb	
	$Md_{la} = 0.125 * \sigma d * lb * la^2$	כיוון la	9
	$Md_{lb} = 0.125 * \sigma d * la * lb^2$	כיוון lb	
	$Md_{la} = 0.5 * [0.5(la - a)]^2 * lb * \sigma d$	כיוון la	10
	$Md_{lb} = 0.5 * [0.5(lb - b)]^2 * la * \sigma d$	כיוון lb	

חישוב חדירה ביסוד			
הערה	נוסחאות		שלב
	$Vd = \sigma d * la * lb$		חישוב כח תכן לחדירה1
	$Vd = Vd - \sigma d * (a * b + 2 * d * (a + b) + \pi * d^2)_m$		חישוב כח תכן חדירה מופחת2
	$b1 = \min \left\{ \begin{matrix} b \\ 3 * d \end{matrix} \right.$	$a1 = \min \left\{ \begin{matrix} 2 * b \\ a \\ 3 * d \end{matrix} \right.$	קביעת היקפי עמוד3
	$u_0 = (2 * a_1 + 2 * b_1)$		חישוב היקף עמוד4
	$u_1 = (u_0 + 2 * \pi * d)$		חישוב היקף קריטי ראשון5
	$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$	מקדם תיקון גובה	חישוב תסבולת ללא זיון לחדירה
כיוון la	$\rho la = \frac{100 * As_{la[cm^2]}}{la_{[cm]} * dy_{[cm]}} \geq 0.002$	$\rho = \sqrt{\rho y * \rho x} \leq 0.02$	חישוב מנת זיון6
כיוון lb	$\rho lb = \frac{100 * As_{lb[cm^2]}}{lb_{[cm]} * dx_{[cm]}} \geq 0.002$		
$Vrdc = \max \left\{ \begin{matrix} 0.12K (100\rho * 0.7 fck_{[\frac{n}{mm^2}]})^{\frac{1}{3}} * \frac{u_1[mm] * d[mm]}{1000} \\ 0.035K^{1.5} * (0.7 fck_{[\frac{n}{mm^2}]})^{0.5} * \frac{u_1[mm] * d[mm]}{1000} \end{matrix} \right.$			
$VrdMax = \min \left\{ \begin{matrix} 0.3 \left(1 - 0.7 * \frac{fck_{[\frac{n}{mm^2}]}}{250} \right) * \frac{u_0[mm] * d[mm] * fcd_{[\frac{n}{mm^2}]}}{1000} \\ 1.5 * Vrdc \end{matrix} \right.$			חישוב תסבולת מקסי' לחדירה7
$Vrdc \geq Vd$		אין צורך בזיון לחדירה	קביעת מקרה8
$Vrdc \leq Vd$		יש צורך בזיון לחדירה	
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חישוב חזירה ביסוד			
הערה	נוסחאות	שלב	
	$Vd la = [0.5 * (la - a) - d] * lb * \sigma d$	כיוון la	1
	$Vd lb = [0.5 * (lb - b) - d] * la * \sigma d$	כיוון lb	
	$VrdMax (la) = 0.27(1 - 0.7 * \frac{fck_{[mm^2]}}{250}) * \frac{lb_{[mm]} * d_{[mm]} * fcd_{[mm^2]}}{2000}$	כיוון la	2
	$VrdMax (lb) = 0.27(1 - 0.7 * \frac{fck_{[mm^2]}}{250}) * \frac{la_{[mm]} * d_{[mm]} * fcd_{[mm^2]}}{2000}$	כיוון lb	
	$100\rho = \frac{100 * As_{la[cm^2]}}{lb_{[cm]} * d_{[cm]}} \geq 0.002$	כיוון la	3
	$100\rho = \frac{100 * As_{lb[cm^2]}}{la_{[cm]} * d_{[cm]}} \geq 0.002$	כיוון lb	
	$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$	מקדם תיקון גובה	4
	$Vrdc = \max \left\{ \begin{matrix} 0.12K (100\rho * 0.7 fck_{[mm^2]})^{\frac{1}{3}} * \frac{lb_{[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck_{[mm^2]})^{0.5} * \frac{lb_{[mm]} * d_{[mm]}}{1000} \end{matrix} \right.$	כיוון la	
	$Vrdc = \max \left\{ \begin{matrix} 0.12K (100\rho * 0.7 fck_{[mm^2]})^{\frac{1}{3}} * \frac{la_{[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck_{[mm^2]})^{0.5} * \frac{la_{[mm]} * d_{[mm]}}{1000} \end{matrix} \right.$	כיוון lb	
	$Vd \leq Vrdc$	אין צורך בזיון לחזירה	5
	$Vd \geq Vrdc$	יש צורך בזיון מחושב	

חישובי מהלכים בכיוון La

$$Q_1 = \sigma d * L_1 * lb$$

$$Q_2 = Q_1 - Nd_1$$

$$Q_3 = Q_2 + C * \sigma d * lb$$

$$Q_4 = Q_3 - Nd_2$$

$$M_1 = 0.5 * \sigma d * L_1^2 * lb$$

$$-M_2 = M_1 - \frac{Q_2^2}{2 * \sigma d * lb}$$

$$M_3 = 0.5 * \sigma d * L_2^2 * lb$$

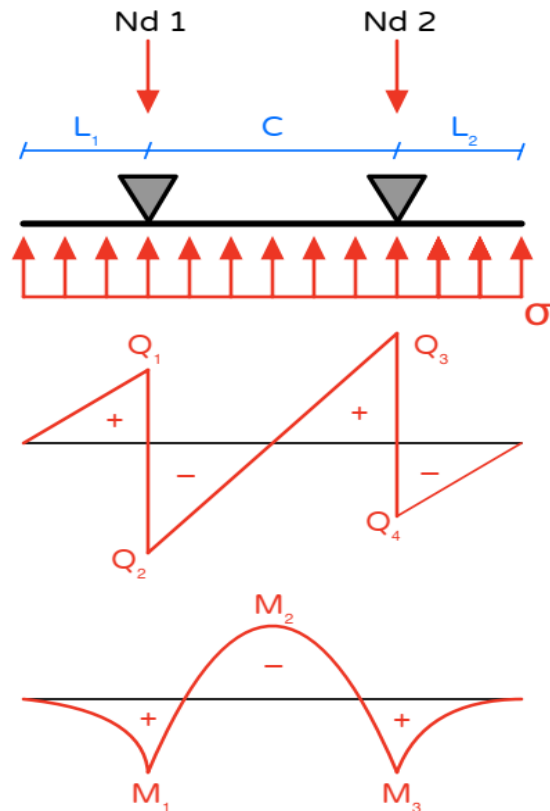
חישוב כח גזירה

8

חישוב מהלכי כפיפה מירביים

9

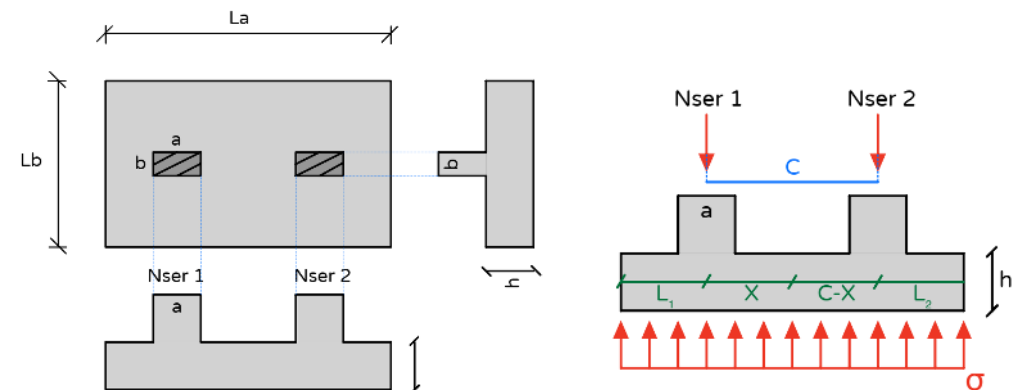
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תכנון יסוד משותף

הערה	נוסחאות	שלב	
	$Nser\ 1_{[kn]} = \Delta g_{[kn]} + Qk_{[kn]}$ $Nser\ 2_{[kn]} = \Delta g_{[kn]} + Qk_{[kn]}$	מציאת שטח יסוד דרוש וחישוב כוחות	1
	$A_{[m^2]} = \frac{Nser\ 1 + Nser\ 2_{[kn]}}{\sigma \text{ מותר}}$	שטח יסוד לפי המאמץ המותר בקרקע	2
	$La = \frac{A}{Lb}$	חישוב אורך היסוד	3
הגדרת la\lb	$\sigma_{act\ \frac{kn}{m^2}} = \frac{Nser\ 1 + Nser\ 2_{[kn]}}{la * lb_{[m]}}$	חישוב מאמץ בקרקע	4
Nd = 1.45 Nser	$Nd\ 1_{[kn]} = 1.6Qk_{[kn]} + 1.4\Delta g_{[kn]}$ $Nd\ 2_{[kn]} = 1.6Qk_{[kn]} + 1.4\Delta g_{[kn]}$	חישוב עומס תכן	5
	$\sigma d_{\frac{kn}{m^2}} = \frac{Nd\ 1 + Nd\ 2_{[kn]}}{la * lb_{[m]}}$	חישוב מאמץ תכן	6
	$x = \frac{Nser\ 2 * C_m}{L_m * B_m * \sigma \text{ מותר}}$	מציאת מיקום נקודת שקול הכוחות ביסוד	7
	$L_1 = 0.5L - X$ $L_2 = 0.5L - C + X$		

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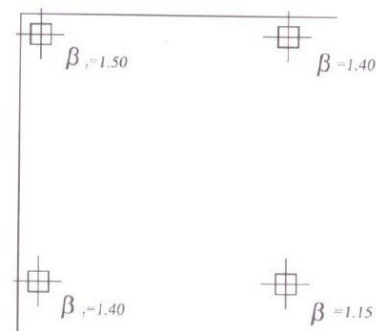


חישוב גזירה ביסוד			
הערה	נוסחאון	שלב	
	$Vd \text{ la} = Q_d - \sigma d * lb * \left(\frac{a}{2} + d\right)$	חישוב כח תכן לגזירה	1
	$VrdMax (la) = 0.27(1 - 0.7 * \frac{fck[\frac{n}{mm^2}]}{250}) * \frac{lb_{[mm]} * d_{[mm]} * fcd[\frac{n}{mm^2}]}{2000}$	חישוב תסבולת מקסימלית לגזירה	2
	$100\rho = \frac{100 * As_{la[cm^2]}}{lb_{[cm]} * d_{[cm]}} \geq 0.002$	חישוב מנת זיון	3
	$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$	מקדם תיקון גובה	4
	$Vrdc = \max \begin{cases} 0.12K (100\rho * 0.7 fck[\frac{n}{mm^2}])^{\frac{1}{3}} * \frac{lb_{[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck[\frac{n}{mm^2}])^{0.5} * \frac{lb_{[mm]} * d_{[mm]}}{1000} \end{cases}$	חישוב תסבולת ללא זיון לגזירה	
$Vd \leq Vrdc$	אין צורך בזיון לגזירה	קביעת מקרה	5
$Vd \geq Vrdc$	יש צורך בזיון מחושב		
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שטחי זיון היסוד			
הערה	נוסחאון	שלב	
	$ASmin_{[cm^2]} = 0.002 * lb_{[cm]} * d_{[cm]}$	חישוב מגבלות זיון בכיוון La	1
	$\omega = 1 - \left(1 - \frac{2 * Md \text{ la}_{[kn*m]}}{lb_{[m]} * d_{[cm]}^2 * fcd_{[kn/cm^2]}}\right)^{0.5}$	חישוב יחס חלק לחוץ בחתך - אומגה ω	2
	$AS \text{ la}_{[cm^2]} = \frac{Md \text{ la}_{[kn*m]}}{\left(1 - \frac{\omega \text{ la}}{2}\right) * d_{[m]} * fsd_{[kn/cm^2]}}$	חישוב שטח זיון	3
	קביעת הברזל תעשה לפי אורך היסוד ולא לפי רצועה של 100 ס"מ לצורך קביעת הברזל יש לחשב לפי 100 ס"מ - טבלת זיון ראשי $ASmin_{[cm^2]} = 0.002 * 100_{[cm]} * d_{[cm]}$	בחירת ברזל $n \Phi @$	4
למדא - חזקים בבטון WWW.LAMDASTATICS.CO.IL			



חישוב חדירה ביסוד				
הערה	נוסחאות		שלב	
	$Vd = \sigma d * la * lb$		חישוב כח תכן לחדירה	1
	$Vd = Vd - \sigma d * (a * b + 2 * d * (a + b) + \pi * d^2)_m - Nd$		חישוב כח תכן חדירה מופחת	2
	$b1 = \min \left\{ \begin{matrix} b \\ 3 * d \end{matrix} \right.$	$a1 = \min \left\{ \begin{matrix} 2 * b \\ a \\ 3 * d \end{matrix} \right.$	קביעת היקפי עמוד	3
	$u_0 = (2 * a_1 + 2 * b_1)$		חישוב היקף עמוד	4
	$u_1 = (u_0 + 2 * \pi * d)$		חישוב היקף קריטי ראשון	5
	$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$	מקדם תיקון גובה	חישוב תסבולת ללא זיון לחדירה	6
	$\rho la = \frac{100 * As_{la[cm^2]}}{la_{[cm]} * dy_{[cm]}} \geq 0.002$	$\rho = \sqrt{\rho y * \rho x} \leq 0.02$	חישוב מנת זיון	
	$Vrdc = \max \left\{ \begin{matrix} 0.12K (100\rho * 0.7 fck_{[\frac{n}{mm^2}]})^{\frac{1}{3}} * \frac{u_{1[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck_{[\frac{n}{mm^2}]})^{0.5} * \frac{u_{1[mm]} * d_{[mm]}}{1000} \end{matrix} \right.$			
	$VrdMax = \min \left\{ \begin{matrix} 0.3 \left(1 - 0.7 * \frac{fck_{[\frac{n}{mm^2}]}}{250} \right) * \frac{u_{0[mm]} * d_{[mm]} * fcd_{[\frac{n}{mm^2}]}}{1000} \\ 1.5 * Vrdc \end{matrix} \right.$		חישוב תסבולת מקסי' לחדירה	7
	$Vrdc \geq Vd$	אין צורך בזיון לחדירה	קביעת מקרה	8
	$Vrdc \leq Vd$	יש צורך בזיון לחדירה		
למדא – חזקים בבטון WWW.LAMDASTATICS.CO.IL				



ציור 16.7

חדירה				
הערה	נוסחאון		שלב	
	עמוד פינתי = 1.5 עמוד שפה = 1.4 עמוד פנימי = 1.15	$Vd_{eq} = \beta * Vd$	חישוב כח חדירה שקיל	1
$a1 > b1$	$b1 = \min \left\{ \begin{matrix} b \\ 3 * d \end{matrix} \right.$	$a1 = \min \left\{ \begin{matrix} 2 * b \\ a \\ 3 * d \end{matrix} \right.$	קביעת מידות עמוד	2
	$u_{0cm} = (2 * a_1 + 2 * b_1)$		חישוב היקף עמוד	3
תקרה d	$u_{1cm} = (u_0 + 4 * \pi * d)$		חישוב היקף קריטי ראשון	4
	מנת הזיון בתקרה	מקדם תיקון גובה	חישוב תסבולת ללא זיון לחדירה	5
	$\rho = \sqrt{\rho_y * \rho_x} \leq 0.02$	$K = 1 + \sqrt{\frac{20}{d_{[cm]}}} \leq 2$		
	$Vrdc = \max \left\{ \begin{matrix} 0.12K (100\rho * 0.7 fck_{[\frac{n}{mm^2}]})^{\frac{1}{3}} * \frac{u_{1[mm]} * d_{[mm]}}{1000} \\ 0.035K^{1.5} * (0.7 fck_{[\frac{n}{mm^2}]})^{0.5} * \frac{u_{1[mm]} * d_{[mm]}}{1000} \end{matrix} \right.$		חישוב תסבולת מקס' לחדירה	6
	$VrdMax = 0.3(1 - 0.7 * \frac{fck_{[\frac{n}{mm^2}]}}{250}) * \frac{u_{0[mm]} * d_{[mm]} * fcd_{[\frac{n}{mm^2}]}}{2000}$			
	$Vrdc \geq Vd_{eq}$	אין צורך בזיון לחדירה	קביעת מקרה	7
	$Vrdc \leq Vd_{eq}$	יש צורך בזיון לחדירה (היקף ראשון)		
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טבלאות K11

$\frac{b_f}{b_w}$														
2.3	2.2	2.1	2	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1	$\frac{h}{t_f}$
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
0.988	0.989	0.990	0.991	0.992	0.993	0.994	0.994	0.995	0.996	0.997	0.998	0.999	1.000	1.1
0.976	0.978	0.980	0.982	0.983	0.985	0.987	0.989	0.991	0.993	0.994	0.996	0.998	1.000	1.2
0.964	0.967	0.969	0.972	0.975	0.978	0.981	0.983	0.986	0.989	0.992	0.994	0.997	1.000	1.3
0.952	0.956	0.959	0.963	0.967	0.970	0.974	0.978	0.982	0.985	0.989	0.993	0.996	1.000	1.4
0.940	0.945	0.949	0.954	0.958	0.963	0.968	0.972	0.977	0.982	0.986	0.991	0.995	1.000	1.5
0.928	0.933	0.939	0.945	0.950	0.956	0.961	0.967	0.972	0.978	0.983	0.989	0.994	1.000	1.6
0.916	0.922	0.929	0.935	0.942	0.948	0.955	0.961	0.968	0.974	0.981	0.987	0.994	1.000	1.7
0.904	0.911	0.919	0.926	0.933	0.941	0.948	0.956	0.963	0.970	0.978	0.985	0.993	1.000	1.8
0.892	0.900	0.908	0.917	0.925	0.933	0.942	0.950	0.958	0.967	0.975	0.983	0.992	1.000	1.9
0.880	0.889	0.898	0.908	0.917	0.926	0.935	0.945	0.954	0.963	0.972	0.982	0.991	1.000	2
0.880	0.889	0.898	0.907	0.917	0.926	0.935	0.944	0.954	0.963	0.972	0.981	0.991	1.000	2.1
0.879	0.889	0.898	0.907	0.916	0.926	0.935	0.944	0.954	0.963	0.972	0.981	0.991	1.000	2.2
0.879	0.888	0.898	0.907	0.916	0.926	0.935	0.944	0.954	0.963	0.972	0.981	0.991	1.000	2.3
0.879	0.888	0.898	0.907	0.916	0.925	0.935	0.944	0.953	0.963	0.972	0.981	0.991	1.000	2.4
0.879	0.888	0.897	0.907	0.916	0.925	0.935	0.944	0.953	0.963	0.972	0.981	0.991	1.000	2.5
0.878	0.888	0.897	0.907	0.916	0.925	0.935	0.944	0.953	0.963	0.972	0.981	0.991	1.000	2.6
0.878	0.888	0.897	0.906	0.916	0.925	0.934	0.944	0.953	0.963	0.972	0.981	0.991	1.000	2.7
0.878	0.887	0.897	0.906	0.916	0.925	0.934	0.944	0.953	0.962	0.972	0.981	0.991	1.000	2.8
0.878	0.887	0.897	0.906	0.915	0.925	0.934	0.944	0.953	0.962	0.972	0.981	0.991	1.000	2.9
0.878	0.887	0.896	0.906	0.915	0.925	0.934	0.944	0.953	0.962	0.972	0.981	0.991	1.000	3
0.877	0.887	0.896	0.906	0.915	0.925	0.934	0.943	0.953	0.962	0.972	0.981	0.991	1.000	3.1
0.877	0.887	0.896	0.906	0.915	0.924	0.934	0.943	0.953	0.962	0.972	0.981	0.991	1.000	3.2
0.877	0.886	0.896	0.905	0.915	0.924	0.934	0.943	0.953	0.962	0.972	0.981	0.991	1.000	3.3
0.877	0.886	0.896	0.905	0.915	0.924	0.934	0.943	0.953	0.962	0.972	0.981	0.991	1.000	3.4
0.877	0.886	0.896	0.905	0.915	0.924	0.934	0.943	0.953	0.962	0.972	0.981	0.991	1.000	3.5
0.876	0.886	0.895	0.905	0.914	0.924	0.933	0.943	0.952	0.962	0.971	0.981	0.990	1.000	3.6
0.876	0.886	0.895	0.905	0.914	0.924	0.933	0.943	0.952	0.962	0.971	0.981	0.990	1.000	3.7
0.876	0.885	0.895	0.905	0.914	0.924	0.933	0.943	0.952	0.962	0.971	0.981	0.990	1.000	3.8
0.876	0.885	0.895	0.904	0.914	0.923	0.933	0.943	0.952	0.962	0.971	0.981	0.990	1.000	3.9
0.875	0.885	0.895	0.904	0.914	0.923	0.933	0.943	0.952	0.962	0.971	0.981	0.990	1.000	4
0.875	0.885	0.894	0.904	0.914	0.923	0.933	0.942	0.952	0.962	0.971	0.981	0.990	1.000	4.1
0.875	0.885	0.894	0.904	0.913	0.923	0.933	0.942	0.952	0.962	0.971	0.981	0.990	1.000	4.2
0.875	0.884	0.894	0.904	0.913	0.923	0.933	0.942	0.952	0.961	0.971	0.981	0.990	1.000	4.3
0.875	0.884	0.894	0.904	0.913	0.923	0.932	0.942	0.952	0.961	0.971	0.981	0.990	1.000	4.4
0.874	0.884	0.894	0.903	0.913	0.923	0.932	0.942	0.952	0.961	0.971	0.981	0.990	1.000	4.5
0.874	0.884	0.893	0.903	0.913	0.923	0.932	0.942	0.952	0.961	0.971	0.981	0.990	1.000	4.6
0.874	0.884	0.893	0.903	0.913	0.922	0.932	0.942	0.952	0.961	0.971	0.981	0.990	1.000	4.7
0.874	0.883	0.893	0.903	0.913	0.922	0.932	0.942	0.951	0.961	0.971	0.981	0.990	1.000	4.8
0.873	0.883	0.893	0.903	0.912	0.922	0.932	0.942	0.951	0.961	0.971	0.981	0.990	1.000	4.9

טבלאות K11

$\frac{b_f}{b_w}$														
2.3	2.2	2.1	2	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1	$\frac{h}{t_f}$
0.873	0.883	0.893	0.903	0.912	0.922	0.932	0.942	0.951	0.961	0.971	0.981	0.990	1.000	5
0.872	0.882	0.892	0.902	0.912	0.922	0.931	0.941	0.951	0.961	0.971	0.980	0.990	1.000	5.2
0.872	0.882	0.891	0.901	0.911	0.921	0.931	0.941	0.951	0.961	0.970	0.980	0.990	1.000	5.4
0.871	0.881	0.891	0.901	0.911	0.921	0.930	0.940	0.950	0.960	0.970	0.980	0.990	1.000	5.6
0.870	0.880	0.890	0.900	0.910	0.920	0.930	0.940	0.950	0.960	0.970	0.980	0.990	1.000	5.8
0.869	0.879	0.889	0.900	0.910	0.920	0.930	0.940	0.950	0.960	0.970	0.980	0.990	1.000	6
0.869	0.879	0.889	0.899	0.909	0.919	0.929	0.939	0.949	0.960	0.970	0.980	0.990	1.000	6.2
0.868	0.878	0.888	0.898	0.908	0.919	0.929	0.939	0.949	0.959	0.969	0.980	0.990	1.000	6.4
0.867	0.877	0.887	0.898	0.908	0.918	0.928	0.939	0.949	0.959	0.969	0.980	0.990	1.000	6.6
0.866	0.877	0.887	0.897	0.907	0.918	0.928	0.938	0.949	0.959	0.969	0.979	0.990	1.000	6.8
0.865	0.876	0.886	0.897	0.907	0.917	0.928	0.938	0.948	0.959	0.969	0.979	0.990	1.000	7
0.865	0.875	0.886	0.896	0.906	0.917	0.927	0.938	0.948	0.958	0.969	0.979	0.990	1.000	7.2
0.864	0.875	0.885	0.895	0.906	0.916	0.927	0.937	0.948	0.958	0.969	0.979	0.990	1.000	7.4
0.863	0.874	0.884	0.895	0.905	0.916	0.926	0.937	0.947	0.958	0.968	0.979	0.989	1.000	7.6
0.863	0.873	0.884	0.894	0.905	0.915	0.926	0.937	0.947	0.958	0.968	0.979	0.989	1.000	7.8
0.862	0.873	0.883	0.894	0.904	0.915	0.926	0.936	0.947	0.958	0.968	0.979	0.989	1.000	8
0.861	0.872	0.883	0.893	0.904	0.915	0.925	0.936	0.947	0.957	0.968	0.979	0.989	1.000	8.2
0.861	0.871	0.882	0.893	0.903	0.914	0.925	0.936	0.946	0.957	0.968	0.979	0.989	1.000	8.4
0.860	0.871	0.881	0.892	0.903	0.914	0.925	0.935	0.946	0.957	0.968	0.978	0.989	1.000	8.6
0.859	0.870	0.881	0.892	0.903	0.913	0.924	0.935	0.946	0.957	0.968	0.978	0.989	1.000	8.8
0.859	0.869	0.880	0.891	0.902	0.913	0.924	0.935	0.946	0.956	0.967	0.978	0.989	1.000	9
0.858	0.869	0.880	0.891	0.902	0.913	0.923	0.934	0.945	0.956	0.967	0.978	0.989	1.000	9.2
0.857	0.868	0.879	0.890	0.901	0.912	0.923	0.934	0.945	0.956	0.967	0.978	0.989	1.000	9.4
0.856	0.867	0.879	0.890	0.901	0.912	0.923	0.934	0.945	0.956	0.967	0.978	0.989	1.000	9.6
0.856	0.867	0.878	0.889	0.900	0.911	0.922	0.933	0.945	0.956	0.967	0.978	0.989	1.000	9.8
0.855	0.866	0.877	0.889	0.900	0.911	0.922	0.933	0.944	0.955	0.967	0.978	0.989	1.000	10

טבלאות K11

$\frac{b_f}{b_w}$														
3.7	3.6	3.5	3.4	3.3	3.2	3.1	3	2.9	2.8	2.7	2.6	2.5	2.4	$\frac{h}{t_f}$
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
0.979	0.979	0.980	0.980	0.980	0.981	0.981	0.982	0.982	0.983	0.984	0.985	0.986	0.987	1.1
0.958	0.958	0.959	0.960	0.961	0.961	0.962	0.963	0.965	0.967	0.969	0.970	0.972	0.974	1.2
0.936	0.937	0.939	0.940	0.941	0.942	0.943	0.945	0.947	0.950	0.953	0.956	0.958	0.961	1.3
0.915	0.917	0.918	0.920	0.921	0.923	0.924	0.926	0.930	0.933	0.937	0.941	0.945	0.948	1.4
0.894	0.896	0.898	0.900	0.902	0.904	0.906	0.908	0.912	0.917	0.921	0.926	0.931	0.935	1.5
0.873	0.875	0.877	0.880	0.882	0.884	0.887	0.889	0.895	0.900	0.906	0.911	0.917	0.922	1.6
0.851	0.854	0.857	0.860	0.862	0.865	0.868	0.871	0.877	0.883	0.890	0.896	0.903	0.909	1.7
0.830	0.833	0.836	0.840	0.843	0.846	0.849	0.852	0.859	0.867	0.874	0.882	0.889	0.896	1.8
0.809	0.812	0.816	0.819	0.823	0.826	0.830	0.834	0.842	0.850	0.858	0.867	0.875	0.883	1.9
0.788	0.792	0.796	0.799	0.803	0.807	0.811	0.815	0.824	0.834	0.843	0.852	0.861	0.871	2
0.787	0.791	0.795	0.799	0.803	0.807	0.811	0.815	0.824	0.833	0.842	0.852	0.861	0.870	2.1
0.787	0.791	0.795	0.799	0.803	0.806	0.810	0.814	0.824	0.833	0.842	0.851	0.861	0.870	2.2
0.787	0.790	0.794	0.798	0.802	0.806	0.810	0.814	0.823	0.833	0.842	0.851	0.860	0.870	2.3
0.786	0.790	0.794	0.798	0.802	0.806	0.810	0.814	0.823	0.832	0.842	0.851	0.860	0.870	2.4
0.786	0.790	0.794	0.798	0.802	0.805	0.809	0.813	0.823	0.832	0.841	0.851	0.860	0.869	2.5
0.785	0.789	0.793	0.797	0.801	0.805	0.809	0.813	0.822	0.832	0.841	0.850	0.860	0.869	2.6
0.785	0.789	0.793	0.797	0.801	0.805	0.809	0.813	0.822	0.831	0.841	0.850	0.860	0.869	2.7
0.785	0.789	0.792	0.796	0.800	0.804	0.808	0.812	0.822	0.831	0.840	0.850	0.859	0.869	2.8
0.784	0.788	0.792	0.796	0.800	0.804	0.808	0.812	0.821	0.831	0.840	0.850	0.859	0.868	2.9
0.784	0.788	0.792	0.796	0.800	0.804	0.808	0.812	0.821	0.830	0.840	0.849	0.859	0.868	3
0.783	0.787	0.791	0.795	0.799	0.803	0.807	0.811	0.821	0.830	0.840	0.849	0.859	0.868	3.1
0.783	0.787	0.791	0.795	0.799	0.803	0.807	0.811	0.820	0.830	0.839	0.849	0.858	0.868	3.2
0.783	0.787	0.791	0.795	0.799	0.803	0.807	0.811	0.820	0.830	0.839	0.849	0.858	0.867	3.3
0.782	0.786	0.790	0.794	0.798	0.802	0.806	0.810	0.820	0.829	0.839	0.848	0.858	0.867	3.4
0.782	0.786	0.790	0.794	0.798	0.802	0.806	0.810	0.820	0.829	0.839	0.848	0.858	0.867	3.5
0.781	0.785	0.789	0.794	0.798	0.802	0.806	0.810	0.819	0.829	0.838	0.848	0.857	0.867	3.6
0.781	0.785	0.789	0.793	0.797	0.801	0.805	0.809	0.819	0.828	0.838	0.847	0.857	0.867	3.7
0.781	0.785	0.789	0.793	0.797	0.801	0.805	0.809	0.819	0.828	0.838	0.847	0.857	0.866	3.8
0.780	0.784	0.788	0.792	0.796	0.801	0.805	0.809	0.818	0.828	0.837	0.847	0.857	0.866	3.9
0.780	0.784	0.788	0.792	0.796	0.800	0.804	0.808	0.818	0.828	0.837	0.847	0.856	0.866	4
0.779	0.784	0.788	0.792	0.796	0.800	0.804	0.808	0.818	0.827	0.837	0.846	0.856	0.866	4.1
0.779	0.783	0.787	0.791	0.795	0.799	0.804	0.808	0.817	0.827	0.837	0.846	0.856	0.865	4.2
0.779	0.783	0.787	0.791	0.795	0.799	0.803	0.807	0.817	0.827	0.836	0.846	0.856	0.865	4.3
0.778	0.782	0.787	0.791	0.795	0.799	0.803	0.807	0.817	0.826	0.836	0.846	0.855	0.865	4.4
0.778	0.782	0.786	0.790	0.794	0.798	0.803	0.807	0.816	0.826	0.836	0.845	0.855	0.865	4.5
0.778	0.782	0.786	0.790	0.794	0.798	0.802	0.806	0.816	0.826	0.835	0.845	0.855	0.864	4.6
0.777	0.781	0.785	0.790	0.794	0.798	0.802	0.806	0.816	0.825	0.835	0.845	0.855	0.864	4.7
0.777	0.781	0.785	0.789	0.793	0.797	0.802	0.806	0.815	0.825	0.835	0.845	0.854	0.864	4.8
0.776	0.780	0.785	0.789	0.793	0.797	0.801	0.805	0.815	0.825	0.835	0.844	0.854	0.864	4.9

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$\frac{b_f}{b_w}$														$\frac{b_f}{b_w}$	
3.7	3.6	3.5	3.4	3.3	3.2	3.1	3	2.9	2.8	2.7	2.6	2.5	2.4		$\frac{h}{t_f}$
0.776	0.780	0.784	0.788	0.793	0.797	0.801	0.805	0.815	0.825	0.834	0.844	0.854	0.864	5	
0.775	0.779	0.783	0.787	0.791	0.796	0.800	0.804	0.814	0.823	0.833	0.843	0.853	0.863	5.2	
0.774	0.778	0.782	0.786	0.790	0.794	0.798	0.803	0.812	0.822	0.832	0.842	0.852	0.862	5.4	
0.773	0.777	0.781	0.785	0.789	0.793	0.797	0.801	0.811	0.821	0.831	0.841	0.851	0.861	5.6	
0.772	0.776	0.780	0.784	0.788	0.792	0.796	0.800	0.810	0.820	0.830	0.840	0.850	0.860	5.8	
0.770	0.775	0.779	0.783	0.787	0.791	0.795	0.799	0.809	0.819	0.829	0.839	0.849	0.859	6	
0.769	0.773	0.778	0.782	0.786	0.790	0.794	0.798	0.808	0.818	0.828	0.838	0.848	0.858	6.2	
0.768	0.772	0.776	0.780	0.784	0.789	0.793	0.797	0.807	0.817	0.827	0.837	0.847	0.858	6.4	
0.767	0.771	0.775	0.779	0.783	0.787	0.791	0.795	0.806	0.816	0.826	0.836	0.847	0.857	6.6	
0.766	0.770	0.774	0.778	0.782	0.786	0.790	0.794	0.804	0.815	0.825	0.835	0.846	0.856	6.8	
0.765	0.769	0.773	0.777	0.781	0.785	0.789	0.793	0.803	0.814	0.824	0.834	0.845	0.855	7	
0.764	0.768	0.772	0.776	0.780	0.784	0.788	0.792	0.802	0.813	0.823	0.834	0.844	0.854	7.2	
0.763	0.767	0.771	0.775	0.779	0.783	0.787	0.791	0.801	0.812	0.822	0.833	0.843	0.854	7.4	
0.762	0.766	0.770	0.774	0.778	0.782	0.786	0.790	0.800	0.811	0.821	0.832	0.842	0.853	7.6	
0.761	0.765	0.769	0.773	0.777	0.781	0.785	0.789	0.799	0.810	0.820	0.831	0.842	0.852	7.8	
0.760	0.764	0.768	0.772	0.776	0.780	0.784	0.788	0.798	0.809	0.820	0.830	0.841	0.851	8	
0.759	0.763	0.767	0.771	0.775	0.779	0.783	0.787	0.797	0.808	0.819	0.829	0.840	0.851	8.2	
0.758	0.762	0.766	0.770	0.774	0.778	0.782	0.786	0.796	0.807	0.818	0.828	0.839	0.850	8.4	
0.757	0.761	0.765	0.769	0.773	0.777	0.780	0.784	0.795	0.806	0.817	0.828	0.838	0.849	8.6	
0.756	0.760	0.764	0.768	0.771	0.775	0.779	0.783	0.794	0.805	0.816	0.827	0.838	0.848	8.8	
0.755	0.759	0.763	0.766	0.770	0.774	0.778	0.782	0.793	0.804	0.815	0.826	0.837	0.848	9	
0.754	0.757	0.761	0.765	0.769	0.773	0.777	0.781	0.792	0.803	0.814	0.825	0.836	0.847	9.2	
0.752	0.756	0.760	0.764	0.768	0.772	0.776	0.780	0.791	0.802	0.813	0.824	0.835	0.846	9.4	
0.751	0.755	0.759	0.763	0.767	0.771	0.775	0.779	0.790	0.801	0.812	0.823	0.834	0.845	9.6	
0.750	0.754	0.758	0.762	0.766	0.770	0.774	0.778	0.789	0.800	0.811	0.822	0.834	0.845	9.8	
0.749	0.753	0.757	0.761	0.765	0.769	0.773	0.777	0.788	0.799	0.810	0.822	0.833	0.844	10	

טבלאות K11

$\frac{b_f}{b_w}$														k ₁₁
5.1	5	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.2	4.1	4	3.9	3.8	$\frac{h}{t_f}$
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
0.973	0.974	0.974	0.974	0.975	0.975	0.976	0.976	0.976	0.977	0.977	0.978	0.978	0.978	1.1
0.947	0.947	0.948	0.949	0.950	0.951	0.951	0.952	0.953	0.954	0.954	0.955	0.956	0.957	1.2
0.920	0.921	0.922	0.923	0.925	0.926	0.927	0.928	0.929	0.930	0.932	0.933	0.934	0.935	1.3
0.894	0.895	0.896	0.898	0.899	0.901	0.903	0.904	0.906	0.907	0.909	0.910	0.912	0.914	1.4
0.867	0.869	0.870	0.872	0.874	0.876	0.878	0.880	0.882	0.884	0.886	0.888	0.890	0.892	1.5
0.841	0.842	0.845	0.847	0.849	0.852	0.854	0.856	0.859	0.861	0.863	0.866	0.868	0.870	1.6
0.814	0.816	0.819	0.821	0.824	0.827	0.830	0.832	0.835	0.838	0.840	0.843	0.846	0.849	1.7
0.788	0.790	0.793	0.796	0.799	0.802	0.805	0.808	0.811	0.815	0.818	0.821	0.824	0.827	1.8
0.761	0.763	0.767	0.770	0.774	0.777	0.781	0.784	0.788	0.791	0.795	0.798	0.802	0.805	1.9
0.735	0.737	0.741	0.745	0.749	0.753	0.757	0.760	0.764	0.768	0.772	0.776	0.780	0.784	2
0.734	0.736	0.740	0.744	0.748	0.752	0.756	0.760	0.764	0.768	0.772	0.776	0.779	0.783	2.1
0.734	0.736	0.740	0.744	0.748	0.752	0.756	0.759	0.763	0.767	0.771	0.775	0.779	0.783	2.2
0.733	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.767	0.771	0.775	0.779	0.783	2.3
0.733	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.766	0.770	0.774	0.778	0.782	2.4
0.732	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.774	0.778	0.782	2.5
0.732	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.773	0.777	0.781	2.6
0.731	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	0.765	0.769	0.773	0.777	0.781	2.7
0.731	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	0.765	0.769	0.773	0.777	0.781	2.8
0.730	0.732	0.736	0.740	0.744	0.748	0.752	0.756	0.760	0.764	0.768	0.772	0.776	0.780	2.9
0.730	0.732	0.736	0.740	0.744	0.748	0.752	0.756	0.760	0.764	0.768	0.772	0.776	0.780	3
0.729	0.731	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.767	0.771	0.775	0.779	3.1
0.729	0.731	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.767	0.771	0.775	0.779	3.2
0.728	0.730	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.767	0.771	0.775	0.779	3.3
0.728	0.730	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.774	0.778	3.4
0.727	0.729	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.774	0.778	3.5
0.727	0.729	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	0.765	0.769	0.773	0.777	3.6
0.726	0.728	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	0.765	0.769	0.773	0.777	3.7
0.725	0.728	0.732	0.736	0.740	0.744	0.748	0.752	0.756	0.760	0.764	0.768	0.773	0.777	3.8
0.725	0.727	0.732	0.736	0.740	0.744	0.748	0.752	0.756	0.760	0.764	0.768	0.772	0.776	3.9
0.724	0.727	0.731	0.735	0.739	0.743	0.747	0.751	0.755	0.760	0.764	0.768	0.772	0.776	4
0.724	0.726	0.731	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.767	0.771	0.775	4.1
0.723	0.726	0.730	0.734	0.738	0.742	0.746	0.751	0.755	0.759	0.763	0.767	0.771	0.775	4.2
0.723	0.726	0.730	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	0.766	0.771	0.775	4.3
0.722	0.725	0.729	0.733	0.737	0.741	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.774	4.4
0.722	0.725	0.729	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	0.766	0.770	0.774	4.5
0.721	0.724	0.728	0.732	0.736	0.740	0.745	0.749	0.753	0.757	0.761	0.765	0.769	0.773	4.6
0.721	0.724	0.728	0.732	0.736	0.740	0.744	0.748	0.752	0.757	0.761	0.765	0.769	0.773	4.7
0.720	0.723	0.727	0.731	0.735	0.740	0.744	0.748	0.752	0.756	0.760	0.764	0.768	0.773	4.8
0.720	0.723	0.727	0.731	0.735	0.739	0.743	0.747	0.751	0.756	0.760	0.764	0.768	0.772	4.9

טבלאות K11

$\frac{b_f}{b_w}$													$\frac{b_f}{b_w}$	k ₁₁
5.1	5	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.2	4.1	4	3.9	3.8	$\frac{h}{t_f}$
0.719	0.722	0.726	0.730	0.734	0.739	0.743	0.747	0.751	0.755	0.759	0.764	0.768	0.772	5
0.718	0.721	0.725	0.729	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	0.767	0.771	5.2
0.718	0.720	0.724	0.728	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	0.766	0.770	5.4
0.717	0.719	0.723	0.728	0.732	0.736	0.740	0.744	0.748	0.752	0.756	0.760	0.764	0.769	5.6
0.716	0.718	0.722	0.727	0.731	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.767	5.8
0.715	0.718	0.722	0.726	0.730	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	0.766	6
0.714	0.717	0.721	0.725	0.729	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	0.765	6.2
0.713	0.716	0.720	0.724	0.728	0.732	0.736	0.740	0.744	0.748	0.752	0.756	0.760	0.764	6.4
0.712	0.715	0.719	0.723	0.727	0.731	0.735	0.739	0.743	0.747	0.751	0.755	0.759	0.763	6.6
0.711	0.714	0.718	0.722	0.726	0.730	0.734	0.738	0.742	0.746	0.750	0.754	0.758	0.762	6.8
0.710	0.713	0.717	0.721	0.725	0.729	0.733	0.737	0.741	0.745	0.749	0.753	0.757	0.761	7
0.709	0.712	0.716	0.720	0.724	0.728	0.732	0.736	0.740	0.744	0.748	0.752	0.756	0.760	7.2
0.708	0.711	0.715	0.719	0.723	0.727	0.731	0.735	0.739	0.743	0.747	0.751	0.755	0.759	7.4
0.707	0.710	0.714	0.718	0.722	0.726	0.730	0.734	0.738	0.742	0.746	0.750	0.754	0.758	7.6
0.706	0.709	0.713	0.717	0.721	0.725	0.729	0.733	0.737	0.741	0.745	0.749	0.753	0.757	7.8
0.705	0.708	0.712	0.716	0.720	0.724	0.728	0.732	0.736	0.740	0.744	0.748	0.752	0.756	8
0.704	0.707	0.711	0.715	0.719	0.723	0.727	0.731	0.735	0.739	0.743	0.747	0.751	0.755	8.2
0.703	0.706	0.710	0.714	0.718	0.722	0.726	0.730	0.734	0.738	0.742	0.746	0.750	0.754	8.4
0.703	0.705	0.709	0.713	0.717	0.721	0.725	0.729	0.733	0.737	0.741	0.745	0.749	0.753	8.6
0.702	0.704	0.708	0.712	0.716	0.720	0.724	0.728	0.732	0.736	0.740	0.744	0.748	0.752	8.8
0.701	0.703	0.707	0.711	0.715	0.719	0.723	0.727	0.731	0.735	0.739	0.743	0.747	0.751	9
0.700	0.702	0.706	0.710	0.714	0.718	0.722	0.726	0.730	0.734	0.738	0.742	0.746	0.750	9.2
0.699	0.701	0.705	0.709	0.713	0.717	0.721	0.725	0.729	0.733	0.737	0.741	0.745	0.749	9.4
0.698	0.700	0.704	0.708	0.712	0.716	0.720	0.724	0.728	0.732	0.736	0.740	0.744	0.747	9.6
0.697	0.699	0.703	0.707	0.711	0.715	0.719	0.723	0.727	0.731	0.735	0.739	0.742	0.746	9.8
0.696	0.698	0.702	0.706	0.710	0.714	0.718	0.722	0.726	0.730	0.734	0.738	0.741	0.745	10

טבלאות K11

$\frac{b_f}{b_w}$														
6.5	6.4	6.3	6.2	6.1	6	5.9	5.8	5.7	5.6	5.5	5.4	5.3	5.2	$\frac{h}{t_f}$
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
0.970	0.970	0.971	0.971	0.971	0.971	0.972	0.972	0.972	0.972	0.973	0.973	0.973	0.973	1.1
0.941	0.941	0.941	0.942	0.942	0.943	0.943	0.944	0.944	0.945	0.945	0.946	0.946	0.946	1.2
0.911	0.911	0.912	0.913	0.914	0.914	0.915	0.916	0.916	0.917	0.918	0.918	0.919	0.920	1.3
0.881	0.882	0.883	0.884	0.885	0.886	0.887	0.887	0.888	0.889	0.890	0.891	0.892	0.893	1.4
0.851	0.852	0.854	0.855	0.856	0.857	0.858	0.859	0.860	0.862	0.863	0.864	0.865	0.866	1.5
0.822	0.823	0.824	0.826	0.827	0.828	0.830	0.831	0.833	0.834	0.835	0.837	0.838	0.839	1.6
0.792	0.793	0.795	0.797	0.798	0.800	0.801	0.803	0.805	0.806	0.808	0.809	0.811	0.813	1.7
0.762	0.764	0.766	0.768	0.769	0.771	0.773	0.775	0.777	0.779	0.780	0.782	0.784	0.786	1.8
0.732	0.734	0.736	0.738	0.741	0.743	0.745	0.747	0.749	0.751	0.753	0.755	0.757	0.759	1.9
0.703	0.705	0.707	0.709	0.712	0.714	0.716	0.719	0.721	0.723	0.725	0.728	0.730	0.732	2
0.702	0.704	0.706	0.709	0.711	0.713	0.716	0.718	0.720	0.723	0.725	0.727	0.730	0.732	2.1
0.701	0.703	0.706	0.708	0.710	0.713	0.715	0.717	0.720	0.722	0.724	0.727	0.729	0.731	2.2
0.700	0.703	0.705	0.707	0.710	0.712	0.714	0.717	0.719	0.721	0.724	0.726	0.728	0.731	2.3
0.700	0.702	0.704	0.707	0.709	0.712	0.714	0.716	0.719	0.721	0.723	0.726	0.728	0.730	2.4
0.699	0.701	0.704	0.706	0.709	0.711	0.713	0.716	0.718	0.720	0.723	0.725	0.727	0.730	2.5
0.698	0.701	0.703	0.706	0.708	0.710	0.713	0.715	0.717	0.720	0.722	0.725	0.727	0.729	2.6
0.698	0.700	0.703	0.705	0.707	0.710	0.712	0.714	0.717	0.719	0.722	0.724	0.726	0.729	2.7
0.697	0.699	0.702	0.704	0.707	0.709	0.711	0.714	0.716	0.719	0.721	0.723	0.726	0.728	2.8
0.696	0.699	0.701	0.704	0.706	0.708	0.711	0.713	0.716	0.718	0.720	0.723	0.725	0.728	2.9
0.696	0.698	0.701	0.703	0.705	0.708	0.710	0.713	0.715	0.718	0.720	0.722	0.725	0.727	3
0.695	0.698	0.700	0.702	0.705	0.707	0.710	0.712	0.715	0.717	0.719	0.722	0.724	0.727	3.1
0.694	0.697	0.699	0.702	0.704	0.707	0.709	0.711	0.714	0.716	0.719	0.721	0.724	0.726	3.2
0.694	0.696	0.699	0.701	0.704	0.706	0.708	0.711	0.713	0.716	0.718	0.721	0.723	0.726	3.3
0.693	0.696	0.698	0.700	0.703	0.705	0.708	0.710	0.713	0.715	0.718	0.720	0.723	0.725	3.4
0.692	0.695	0.697	0.700	0.702	0.705	0.707	0.710	0.712	0.715	0.717	0.720	0.722	0.725	3.5
0.692	0.694	0.697	0.699	0.702	0.704	0.707	0.709	0.712	0.714	0.717	0.719	0.722	0.724	3.6
0.691	0.694	0.696	0.699	0.701	0.704	0.706	0.709	0.711	0.714	0.716	0.719	0.721	0.724	3.7
0.690	0.693	0.695	0.698	0.700	0.703	0.705	0.708	0.710	0.713	0.715	0.718	0.720	0.723	3.8
0.690	0.692	0.695	0.697	0.700	0.702	0.705	0.707	0.710	0.712	0.715	0.717	0.720	0.722	3.9
0.689	0.692	0.694	0.697	0.699	0.702	0.704	0.707	0.709	0.712	0.714	0.717	0.719	0.722	4
0.688	0.691	0.693	0.696	0.699	0.701	0.704	0.706	0.709	0.711	0.714	0.716	0.719	0.721	4.1
0.688	0.690	0.693	0.695	0.698	0.700	0.703	0.706	0.708	0.711	0.713	0.716	0.718	0.721	4.2
0.687	0.690	0.692	0.695	0.697	0.700	0.702	0.705	0.708	0.710	0.713	0.715	0.718	0.720	4.3
0.686	0.689	0.691	0.694	0.697	0.699	0.702	0.704	0.707	0.710	0.712	0.715	0.717	0.720	4.4
0.686	0.688	0.691	0.693	0.696	0.699	0.701	0.704	0.706	0.709	0.712	0.714	0.717	0.719	4.5
0.685	0.688	0.690	0.693	0.695	0.698	0.701	0.703	0.706	0.708	0.711	0.714	0.716	0.719	4.6
0.684	0.687	0.690	0.692	0.695	0.697	0.700	0.703	0.705	0.708	0.710	0.713	0.716	0.718	4.7
0.684	0.686	0.689	0.691	0.694	0.697	0.699	0.702	0.705	0.707	0.710	0.712	0.715	0.718	4.8
0.683	0.686	0.688	0.691	0.693	0.696	0.699	0.701	0.704	0.707	0.709	0.712	0.715	0.717	4.9

טבלאות K11

$\frac{b_f}{b_w}$														
6.5	6.4	6.3	6.2	6.1	6	5.9	5.8	5.7	5.6	5.5	5.4	5.3	5.2	$\frac{h}{t_f}$
0.682	0.685	0.688	0.690	0.693	0.696	0.698	0.701	0.703	0.706	0.709	0.711	0.714	0.717	5
0.682	0.684	0.687	0.689	0.692	0.695	0.697	0.700	0.703	0.705	0.708	0.711	0.713	0.716	5.2
0.681	0.683	0.686	0.689	0.691	0.694	0.697	0.699	0.702	0.704	0.707	0.710	0.712	0.715	5.4
0.680	0.683	0.685	0.688	0.690	0.693	0.696	0.698	0.701	0.704	0.706	0.709	0.711	0.714	5.6
0.679	0.682	0.684	0.687	0.690	0.692	0.695	0.698	0.700	0.703	0.705	0.708	0.711	0.713	5.8
0.679	0.681	0.684	0.686	0.689	0.692	0.694	0.697	0.699	0.702	0.704	0.707	0.710	0.712	6
0.678	0.680	0.683	0.686	0.688	0.691	0.693	0.696	0.698	0.701	0.704	0.706	0.709	0.711	6.2
0.677	0.680	0.682	0.685	0.687	0.690	0.692	0.695	0.698	0.700	0.703	0.705	0.708	0.711	6.4
0.676	0.679	0.681	0.684	0.687	0.689	0.692	0.694	0.697	0.699	0.702	0.705	0.707	0.710	6.6
0.676	0.678	0.681	0.683	0.686	0.688	0.691	0.693	0.696	0.699	0.701	0.704	0.706	0.709	6.8
0.675	0.677	0.680	0.682	0.685	0.688	0.690	0.693	0.695	0.698	0.700	0.703	0.705	0.708	7
0.674	0.676	0.679	0.681	0.684	0.687	0.689	0.692	0.694	0.697	0.699	0.702	0.704	0.707	7.2
0.673	0.675	0.678	0.681	0.683	0.686	0.688	0.691	0.693	0.696	0.698	0.701	0.703	0.706	7.4
0.672	0.675	0.677	0.680	0.682	0.685	0.687	0.690	0.692	0.695	0.697	0.700	0.702	0.705	7.6
0.671	0.674	0.676	0.679	0.681	0.684	0.686	0.689	0.691	0.694	0.696	0.699	0.701	0.704	7.8
0.670	0.673	0.675	0.678	0.680	0.683	0.685	0.688	0.690	0.693	0.695	0.698	0.700	0.703	8
0.669	0.672	0.674	0.677	0.679	0.682	0.684	0.687	0.689	0.692	0.694	0.697	0.699	0.702	8.2
0.668	0.671	0.673	0.676	0.678	0.681	0.683	0.686	0.688	0.691	0.693	0.696	0.698	0.701	8.4
0.668	0.670	0.673	0.675	0.678	0.680	0.683	0.685	0.688	0.690	0.693	0.695	0.698	0.700	8.6
0.667	0.669	0.672	0.674	0.677	0.679	0.682	0.684	0.687	0.689	0.692	0.694	0.697	0.699	8.8
0.666	0.668	0.671	0.673	0.676	0.678	0.681	0.683	0.686	0.688	0.691	0.693	0.696	0.698	9
0.665	0.667	0.670	0.672	0.675	0.677	0.680	0.682	0.685	0.687	0.690	0.692	0.695	0.697	9.2
0.664	0.666	0.669	0.671	0.674	0.676	0.679	0.681	0.684	0.686	0.689	0.691	0.694	0.696	9.4
0.663	0.666	0.668	0.670	0.673	0.675	0.678	0.680	0.683	0.685	0.688	0.690	0.693	0.695	9.6
0.662	0.665	0.667	0.670	0.672	0.674	0.677	0.679	0.682	0.684	0.687	0.689	0.692	0.694	9.8
0.661	0.664	0.666	0.669	0.671	0.674	0.676	0.678	0.681	0.683	0.686	0.688	0.691	0.693	10

טבלאות K11

$\frac{b_f}{b_w}$														
7.9	7.8	7.7	7.6	7.5	7.4	7.3	7.2	7.1	7	6.9	6.8	6.7	6.6	$\frac{h}{t_f}$
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
0.968	0.968	0.968	0.968	0.968	0.969	0.969	0.969	0.969	0.969	0.969	0.970	0.970	0.970	1.1
0.936	0.936	0.936	0.937	0.937	0.937	0.937	0.938	0.938	0.938	0.939	0.939	0.940	0.940	1.2
0.904	0.904	0.904	0.905	0.905	0.906	0.906	0.906	0.907	0.907	0.908	0.909	0.909	0.910	1.3
0.871	0.872	0.872	0.873	0.874	0.874	0.875	0.875	0.876	0.876	0.877	0.878	0.879	0.880	1.4
0.839	0.840	0.841	0.841	0.842	0.843	0.843	0.844	0.845	0.846	0.847	0.848	0.849	0.850	1.5
0.807	0.808	0.809	0.810	0.810	0.811	0.812	0.813	0.814	0.815	0.816	0.817	0.819	0.820	1.6
0.775	0.776	0.777	0.778	0.779	0.780	0.781	0.782	0.783	0.784	0.785	0.787	0.789	0.790	1.7
0.743	0.744	0.745	0.746	0.747	0.748	0.749	0.751	0.752	0.753	0.755	0.756	0.758	0.760	1.8
0.711	0.712	0.713	0.714	0.716	0.717	0.718	0.719	0.721	0.722	0.724	0.726	0.728	0.730	1.9
0.678	0.680	0.681	0.683	0.684	0.685	0.687	0.688	0.690	0.691	0.693	0.696	0.698	0.700	2
0.678	0.679	0.680	0.682	0.683	0.685	0.686	0.687	0.689	0.690	0.693	0.695	0.697	0.700	2.1
0.677	0.678	0.680	0.681	0.682	0.684	0.685	0.687	0.688	0.690	0.692	0.694	0.697	0.699	2.2
0.676	0.677	0.679	0.680	0.682	0.683	0.684	0.686	0.687	0.689	0.691	0.693	0.696	0.698	2.3
0.675	0.676	0.678	0.679	0.681	0.682	0.684	0.685	0.687	0.688	0.690	0.693	0.695	0.697	2.4
0.674	0.676	0.677	0.678	0.680	0.681	0.683	0.684	0.686	0.687	0.690	0.692	0.694	0.697	2.5
0.673	0.675	0.676	0.678	0.679	0.681	0.682	0.684	0.685	0.687	0.689	0.691	0.694	0.696	2.6
0.672	0.674	0.675	0.677	0.678	0.680	0.681	0.683	0.684	0.686	0.688	0.691	0.693	0.695	2.7
0.671	0.673	0.674	0.676	0.678	0.679	0.681	0.682	0.684	0.685	0.688	0.690	0.692	0.695	2.8
0.671	0.672	0.674	0.675	0.677	0.678	0.680	0.681	0.683	0.684	0.687	0.689	0.692	0.694	2.9
0.670	0.671	0.673	0.674	0.676	0.677	0.679	0.681	0.682	0.684	0.686	0.689	0.691	0.693	3
0.669	0.670	0.672	0.674	0.675	0.677	0.678	0.680	0.681	0.683	0.685	0.688	0.690	0.693	3.1
0.668	0.670	0.671	0.673	0.674	0.676	0.677	0.679	0.681	0.682	0.685	0.687	0.690	0.692	3.2
0.667	0.669	0.670	0.672	0.673	0.675	0.677	0.678	0.680	0.681	0.684	0.686	0.689	0.691	3.3
0.666	0.668	0.669	0.671	0.673	0.674	0.676	0.677	0.679	0.681	0.683	0.686	0.688	0.691	3.4
0.665	0.667	0.669	0.670	0.672	0.673	0.675	0.677	0.678	0.680	0.682	0.685	0.687	0.690	3.5
0.664	0.666	0.668	0.669	0.671	0.673	0.674	0.676	0.678	0.679	0.682	0.684	0.687	0.689	3.6
0.664	0.665	0.667	0.669	0.670	0.672	0.674	0.675	0.677	0.679	0.681	0.684	0.686	0.689	3.7
0.663	0.664	0.666	0.668	0.669	0.671	0.673	0.674	0.676	0.678	0.680	0.683	0.685	0.688	3.8
0.662	0.664	0.665	0.667	0.669	0.670	0.672	0.674	0.675	0.677	0.680	0.682	0.685	0.687	3.9
0.661	0.663	0.664	0.666	0.668	0.669	0.671	0.673	0.675	0.676	0.679	0.681	0.684	0.686	4
0.660	0.662	0.664	0.665	0.667	0.669	0.670	0.672	0.674	0.676	0.678	0.681	0.683	0.686	4.1
0.659	0.661	0.663	0.664	0.666	0.668	0.670	0.671	0.673	0.675	0.677	0.680	0.683	0.685	4.2
0.658	0.660	0.662	0.664	0.665	0.667	0.669	0.671	0.672	0.674	0.677	0.679	0.682	0.684	4.3
0.657	0.659	0.661	0.663	0.665	0.666	0.668	0.670	0.672	0.673	0.676	0.679	0.681	0.684	4.4
0.657	0.658	0.660	0.662	0.664	0.666	0.667	0.669	0.671	0.673	0.675	0.678	0.680	0.683	4.5
0.656	0.657	0.659	0.661	0.663	0.665	0.667	0.668	0.670	0.672	0.675	0.677	0.680	0.682	4.6
0.655	0.657	0.658	0.660	0.662	0.664	0.666	0.668	0.669	0.671	0.674	0.676	0.679	0.682	4.7
0.654	0.656	0.658	0.659	0.661	0.663	0.665	0.667	0.669	0.670	0.673	0.676	0.678	0.681	4.8
0.653	0.655	0.657	0.659	0.660	0.662	0.664	0.666	0.668	0.670	0.672	0.675	0.678	0.680	4.9

טבלאות K11

$\frac{b_f}{b_w}$														
7.9	7.8	7.7	7.6	7.5	7.4	7.3	7.2	7.1	7	6.9	6.8	6.7	6.6	$\frac{h}{t_f}$
0.652	0.654	0.656	0.658	0.660	0.662	0.663	0.665	0.667	0.669	0.672	0.674	0.677	0.680	5
0.652	0.653	0.655	0.657	0.659	0.661	0.663	0.665	0.666	0.668	0.671	0.674	0.676	0.679	5.2
0.651	0.653	0.655	0.657	0.658	0.660	0.662	0.664	0.666	0.668	0.670	0.673	0.675	0.678	5.4
0.650	0.652	0.654	0.656	0.658	0.660	0.661	0.663	0.665	0.667	0.670	0.672	0.675	0.677	5.6
0.650	0.652	0.654	0.655	0.657	0.659	0.661	0.663	0.664	0.666	0.669	0.671	0.674	0.677	5.8
0.649	0.651	0.653	0.655	0.657	0.658	0.660	0.662	0.664	0.666	0.668	0.671	0.673	0.676	6
0.649	0.651	0.652	0.654	0.656	0.658	0.659	0.661	0.663	0.665	0.667	0.670	0.673	0.675	6.2
0.648	0.650	0.652	0.653	0.655	0.657	0.659	0.661	0.662	0.664	0.667	0.669	0.672	0.674	6.4
0.648	0.649	0.651	0.653	0.655	0.656	0.658	0.660	0.662	0.663	0.666	0.669	0.671	0.674	6.6
0.647	0.649	0.650	0.652	0.654	0.656	0.657	0.659	0.661	0.663	0.665	0.668	0.670	0.673	6.8
0.646	0.648	0.650	0.652	0.653	0.655	0.657	0.659	0.660	0.662	0.665	0.667	0.670	0.672	7
0.823	0.803	0.783	0.763	0.743	0.722	0.702	0.682	0.661	0.661	0.664	0.666	0.669	0.671	7.2
0.822	0.802	0.782	0.762	0.742	0.722	0.701	0.681	0.660	0.660	0.663	0.665	0.668	0.670	7.4
0.822	0.801	0.781	0.761	0.741	0.721	0.700	0.680	0.659	0.659	0.662	0.664	0.667	0.670	7.6
0.821	0.801	0.781	0.760	0.740	0.720	0.700	0.679	0.658	0.659	0.661	0.664	0.666	0.669	7.8
0.820	0.800	0.780	0.760	0.739	0.719	0.699	0.678	0.657	0.658	0.660	0.663	0.665	0.668	8
0.819	0.799	0.779	0.759	0.738	0.718	0.698	0.677	0.656	0.657	0.659	0.662	0.664	0.667	8.2
0.170	0.798	0.778	0.758	0.738	0.717	0.697	0.677	0.656	0.656	0.658	0.661	0.663	0.666	8.4
0.169	0.149	0.777	0.757	0.737	0.716	0.696	0.676	0.655	0.655	0.658	0.660	0.663	0.665	8.6
0.147	0.149	0.128	0.756	0.736	0.716	0.695	0.675	0.654	0.654	0.657	0.659	0.662	0.664	8.8
0.126	0.127	0.128	0.107	0.735	0.715	0.694	0.674	0.653	0.653	0.656	0.658	0.661	0.663	9
0.105	0.105	0.106	0.107	0.086	0.714	0.694	0.673	0.652	0.652	0.655	0.657	0.660	0.662	9.2
0.084	0.084	0.084	0.085	0.086	0.065	0.693	0.672	0.651	0.652	0.654	0.657	0.659	0.661	9.4
0.063	0.063	0.063	0.063	0.064	0.064	0.044	0.671	0.650	0.651	0.653	0.656	0.658	0.661	9.6
0.042	0.042	0.042	0.042	0.042	0.042	0.043	0.022	0.649	0.650	0.652	0.655	0.657	0.660	9.8
0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.000	0.649	0.651	0.654	0.656	0.659	10

טבלאות K11

$\frac{b_f}{b_w}$														
9.3	9.2	9.1	9	8.9	8.8	8.7	8.6	8.5	8.4	8.3	8.2	8.1	8	$\frac{h}{t_f}$
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
0.966	0.966	0.966	0.966	0.966	0.967	0.967	0.967	0.967	0.967	0.967	0.967	0.968	0.968	1.1
0.932	0.932	0.932	0.933	0.933	0.933	0.933	0.934	0.934	0.934	0.935	0.935	0.935	0.935	1.2
0.898	0.898	0.898	0.899	0.899	0.900	0.900	0.901	0.901	0.901	0.902	0.902	0.903	0.903	1.3
0.864	0.864	0.865	0.865	0.866	0.866	0.867	0.867	0.868	0.869	0.869	0.870	0.870	0.871	1.4
0.829	0.830	0.831	0.832	0.832	0.833	0.834	0.834	0.835	0.836	0.836	0.837	0.838	0.839	1.5
0.795	0.796	0.797	0.798	0.799	0.799	0.800	0.801	0.802	0.803	0.804	0.805	0.805	0.806	1.6
0.761	0.762	0.763	0.764	0.765	0.766	0.767	0.768	0.769	0.770	0.771	0.772	0.773	0.774	1.7
0.727	0.728	0.729	0.730	0.732	0.733	0.734	0.735	0.736	0.737	0.738	0.739	0.740	0.742	1.8
0.693	0.694	0.695	0.697	0.698	0.699	0.700	0.702	0.703	0.704	0.706	0.707	0.708	0.709	1.9
0.659	0.660	0.662	0.663	0.664	0.666	0.667	0.669	0.670	0.671	0.673	0.674	0.676	0.677	2
0.658	0.659	0.661	0.662	0.663	0.665	0.666	0.668	0.669	0.670	0.672	0.673	0.675	0.676	2.1
0.657	0.658	0.659	0.661	0.662	0.664	0.665	0.667	0.668	0.669	0.671	0.672	0.674	0.675	2.2
0.656	0.657	0.658	0.660	0.661	0.663	0.664	0.666	0.667	0.669	0.670	0.671	0.673	0.674	2.3
0.654	0.656	0.657	0.659	0.660	0.662	0.663	0.665	0.666	0.668	0.669	0.671	0.672	0.673	2.4
0.653	0.655	0.656	0.658	0.659	0.661	0.662	0.664	0.665	0.667	0.668	0.670	0.671	0.673	2.5
0.652	0.654	0.655	0.657	0.658	0.660	0.661	0.663	0.664	0.666	0.667	0.669	0.670	0.672	2.6
0.651	0.653	0.654	0.656	0.657	0.659	0.660	0.662	0.663	0.665	0.666	0.668	0.669	0.671	2.7
0.650	0.652	0.653	0.655	0.656	0.658	0.659	0.661	0.662	0.664	0.665	0.667	0.668	0.670	2.8
0.649	0.651	0.652	0.654	0.655	0.657	0.658	0.660	0.661	0.663	0.664	0.666	0.667	0.669	2.9
0.648	0.649	0.651	0.653	0.654	0.656	0.657	0.659	0.660	0.662	0.663	0.665	0.667	0.668	3
0.647	0.648	0.650	0.652	0.653	0.655	0.656	0.658	0.659	0.661	0.663	0.664	0.666	0.667	3.1
0.646	0.647	0.649	0.650	0.652	0.654	0.655	0.657	0.658	0.660	0.662	0.663	0.665	0.666	3.2
0.645	0.646	0.648	0.649	0.651	0.653	0.654	0.656	0.657	0.659	0.661	0.662	0.664	0.665	3.3
0.644	0.645	0.647	0.648	0.650	0.652	0.653	0.655	0.656	0.658	0.660	0.661	0.663	0.665	3.4
0.642	0.644	0.646	0.647	0.649	0.651	0.652	0.654	0.656	0.657	0.659	0.660	0.662	0.664	3.5
0.641	0.643	0.645	0.646	0.648	0.650	0.651	0.653	0.655	0.656	0.658	0.659	0.661	0.663	3.6
0.640	0.642	0.644	0.645	0.647	0.649	0.650	0.652	0.654	0.655	0.657	0.659	0.660	0.662	3.7
0.639	0.641	0.643	0.644	0.646	0.648	0.649	0.651	0.653	0.654	0.656	0.658	0.659	0.661	3.8
0.638	0.640	0.641	0.643	0.645	0.647	0.648	0.650	0.652	0.653	0.655	0.657	0.658	0.660	3.9
0.637	0.639	0.640	0.642	0.644	0.646	0.647	0.649	0.651	0.652	0.654	0.656	0.658	0.659	4
0.636	0.638	0.639	0.641	0.643	0.645	0.646	0.648	0.650	0.651	0.653	0.655	0.657	0.658	4.1
0.635	0.637	0.638	0.640	0.642	0.644	0.645	0.647	0.649	0.650	0.652	0.654	0.656	0.657	4.2
0.634	0.635	0.637	0.639	0.641	0.642	0.644	0.646	0.648	0.650	0.651	0.653	0.655	0.657	4.3
0.633	0.634	0.636	0.638	0.640	0.641	0.643	0.645	0.647	0.649	0.650	0.652	0.654	0.656	4.4
0.632	0.633	0.635	0.637	0.639	0.640	0.642	0.644	0.646	0.648	0.649	0.651	0.653	0.655	4.5
0.630	0.632	0.634	0.636	0.638	0.639	0.641	0.643	0.645	0.647	0.648	0.650	0.652	0.654	4.6
0.629	0.631	0.633	0.635	0.637	0.638	0.640	0.642	0.644	0.646	0.648	0.649	0.651	0.653	4.7
0.628	0.630	0.632	0.634	0.636	0.637	0.639	0.641	0.643	0.645	0.647	0.648	0.650	0.652	4.8
0.627	0.629	0.631	0.633	0.635	0.636	0.638	0.640	0.642	0.644	0.646	0.648	0.649	0.651	4.9

טבלאות K11

$\frac{b_f}{b_w}$							
10	9.9	9.8	9.7	9.6	9.5	9.4	$\frac{h}{t_f}$
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
0.965	0.965	0.965	0.965	0.965	0.966	0.966	1.1
0.930	0.930	0.930	0.931	0.931	0.931	0.931	1.2
0.895	0.895	0.896	0.896	0.896	0.897	0.897	1.3
0.860	0.860	0.861	0.861	0.862	0.862	0.863	1.4
0.825	0.825	0.826	0.827	0.827	0.828	0.829	1.5
0.789	0.790	0.791	0.792	0.793	0.794	0.794	1.6
0.754	0.755	0.756	0.757	0.758	0.759	0.760	1.7
0.719	0.720	0.721	0.723	0.724	0.725	0.726	1.8
0.684	0.685	0.687	0.688	0.689	0.690	0.692	1.9
0.649	0.650	0.652	0.653	0.655	0.656	0.657	2
0.648	0.649	0.651	0.652	0.653	0.655	0.656	2.1
0.647	0.648	0.649	0.651	0.652	0.654	0.655	2.2
0.645	0.647	0.648	0.650	0.651	0.653	0.654	2.3
0.644	0.646	0.647	0.649	0.650	0.652	0.653	2.4
0.643	0.644	0.646	0.647	0.649	0.650	0.652	2.5
0.642	0.643	0.645	0.646	0.648	0.649	0.651	2.6
0.641	0.642	0.644	0.645	0.647	0.648	0.650	2.7
0.639	0.641	0.642	0.644	0.645	0.647	0.649	2.8
0.638	0.640	0.641	0.643	0.644	0.646	0.647	2.9
0.637	0.639	0.640	0.642	0.643	0.645	0.646	3
0.636	0.637	0.639	0.641	0.642	0.644	0.645	3.1
0.635	0.636	0.638	0.639	0.641	0.643	0.644	3.2
0.633	0.635	0.637	0.638	0.640	0.641	0.643	3.3
0.632	0.634	0.635	0.637	0.639	0.640	0.642	3.4
0.631	0.633	0.634	0.636	0.638	0.639	0.641	3.5
0.630	0.631	0.633	0.635	0.636	0.638	0.640	3.6
0.629	0.630	0.632	0.634	0.635	0.637	0.639	3.7
0.627	0.629	0.631	0.632	0.634	0.636	0.637	3.8
0.626	0.628	0.630	0.631	0.633	0.635	0.636	3.9
0.625	0.627	0.628	0.630	0.632	0.634	0.635	4
0.624	0.626	0.627	0.629	0.631	0.632	0.634	4.1
0.623	0.624	0.626	0.628	0.630	0.631	0.633	4.2
0.621	0.623	0.625	0.627	0.628	0.630	0.632	4.3
0.620	0.622	0.624	0.626	0.627	0.629	0.631	4.4
0.619	0.621	0.623	0.624	0.626	0.628	0.630	4.5
0.618	0.620	0.621	0.623	0.625	0.627	0.629	4.6
0.617	0.618	0.620	0.622	0.624	0.626	0.628	4.7
0.615	0.617	0.619	0.621	0.623	0.625	0.626	4.8
0.614	0.616	0.618	0.620	0.622	0.623	0.625	4.9

טבלאות K11

[illegible]

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
18	25	19.5	19.5	21.92	14	26.29	8.5	36.4	3
17.981	25.1	19.46	19.6	21.858	14.1	26.164	8.6	36.115	3.1
17.962	25.2	19.42	19.7	21.796	14.2	26.038	8.7	35.83	3.2
17.943	25.3	19.38	19.8	21.734	14.3	25.912	8.8	35.545	3.3
17.924	25.4	19.34	19.9	21.672	14.4	25.786	8.9	35.26	3.4
17.905	25.5	19.3	20	21.61	14.5	25.66	9	34.975	3.5
17.886	25.6	19.274	20.1	21.548	14.6	25.534	9.1	34.69	3.6
17.867	25.7	19.248	20.2	21.486	14.7	25.408	9.2	34.405	3.7
17.848	25.8	19.222	20.3	21.424	14.8	25.282	9.3	34.12	3.8
17.829	25.9	19.196	20.4	21.362	14.9	25.156	9.4	33.835	3.9
17.81	26	19.17	20.5	21.3	15	25.03	9.5	33.55	4
17.791	26.1	19.144	20.6	21.26	15.1	24.904	9.6	33.265	4.1
17.772	26.2	19.118	20.7	21.22	15.2	24.778	9.7	32.98	4.2
17.753	26.3	19.092	20.8	21.18	15.3	24.652	9.8	32.695	4.3
17.734	26.4	19.066	20.9	21.14	15.4	24.526	9.9	32.41	4.4
17.715	26.5	19.04	21	21.1	15.5	24.4	10	32.125	4.5
17.696	26.6	19.014	21.1	21.06	15.6	24.338	10.1	31.84	4.6
17.677	26.7	18.988	21.2	21.02	15.7	24.276	10.2	31.555	4.7
17.658	26.8	18.962	21.3	20.98	15.8	24.214	10.3	31.27	4.8
17.639	26.9	18.936	21.4	20.94	15.9	24.152	10.4	30.985	4.9
17.62	27	18.91	21.5	20.9	16	24.09	10.5	30.7	5
17.601	27.1	18.884	21.6	20.86	16.1	24.028	10.6	30.574	5.1
17.582	27.2	18.858	21.7	20.82	16.2	23.966	10.7	30.448	5.2
17.563	27.3	18.832	21.8	20.78	16.3	23.904	10.8	30.322	5.3
17.544	27.4	18.806	21.9	20.74	16.4	23.842	10.9	30.196	5.4
17.525	27.5	18.78	22	20.7	16.5	23.78	11	30.07	5.5
17.506	27.6	18.754	22.1	20.66	16.6	23.718	11.1	29.944	5.6
17.487	27.7	18.728	22.2	20.62	16.7	23.656	11.2	29.818	5.7
17.468	27.8	18.702	22.3	20.58	16.8	23.594	11.3	29.692	5.8
17.449	27.9	18.676	22.4	20.54	16.9	23.532	11.4	29.566	5.9
17.43	28	18.65	22.5	20.5	17	23.47	11.5	29.44	6
17.411	28.1	18.624	22.6	20.46	17.1	23.408	11.6	29.314	6.1
17.392	28.2	18.598	22.7	20.42	17.2	23.346	11.7	29.188	6.2
17.373	28.3	18.572	22.8	20.38	17.3	23.284	11.8	29.062	6.3
17.354	28.4	18.546	22.9	20.34	17.4	23.222	11.9	28.936	6.4
17.335	28.5	18.52	23	20.3	17.5	23.16	12	28.81	6.5
17.316	28.6	18.494	23.1	20.26	17.6	23.098	12.1	28.684	6.6
17.297	28.7	18.468	23.2	20.22	17.7	23.036	12.2	28.558	6.7
17.278	28.8	18.442	23.3	20.18	17.8	22.974	12.3	28.432	6.8
17.259	28.9	18.416	23.4	20.14	17.9	22.912	12.4	28.306	6.9
17.24	29	18.39	23.5	20.1	18	22.85	12.5	28.18	7
17.221	29.1	18.364	23.6	20.06	18.1	22.788	12.6	28.054	7.1
17.202	29.2	18.338	23.7	20.02	18.2	22.726	12.7	27.928	7.2
17.183	29.3	18.312	23.8	19.98	18.3	22.664	12.8	27.802	7.3
17.164	29.4	18.286	23.9	19.94	18.4	22.602	12.9	27.676	7.4
17.145	29.5	18.26	24	19.9	18.5	22.54	13	27.55	7.5
17.126	29.6	18.234	24.1	19.86	18.6	22.478	13.1	27.424	7.6
17.107	29.7	18.208	24.2	19.82	18.7	22.416	13.2	27.298	7.7
17.088	29.8	18.182	24.3	19.78	18.8	22.354	13.3	27.172	7.8
17.069	29.9	18.156	24.4	19.74	18.9	22.292	13.4	27.046	7.9
17.05	30	18.13	24.5	19.7	19	22.23	13.5	26.92	8
17.031	30.1	18.104	24.6	19.66	19.1	22.168	13.6	26.794	8.1
17.012	30.2	18.078	24.7	19.62	19.2	22.106	13.7	26.668	8.2
16.993	30.3	18.052	24.8	19.58	19.3	22.044	13.8	26.542	8.3
16.974	30.4	18.026	24.9	19.54	19.4	21.982	13.9	26.416	8.4

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
14.15	52.5	14.66	47	15.32	41.5	15.98	36	16.955	30.5
14.144	52.6	14.648	47.1	15.308	41.6	15.968	36.1	16.936	30.6
14.138	52.7	14.636	47.2	15.296	41.7	15.956	36.2	16.917	30.7
14.132	52.8	14.624	47.3	15.284	41.8	15.944	36.3	16.898	30.8
14.126	52.9	14.612	47.4	15.272	41.9	15.932	36.4	16.879	30.9
14.12	53	14.6	47.5	15.26	42	15.92	36.5	16.86	31
14.114	53.1	14.588	47.6	15.248	42.1	15.908	36.6	16.841	31.1
14.108	53.2	14.576	47.7	15.236	42.2	15.896	36.7	16.822	31.2
14.102	53.3	14.564	47.8	15.224	42.3	15.884	36.8	16.803	31.3
14.096	53.4	14.552	47.9	15.212	42.4	15.872	36.9	16.784	31.4
14.09	53.5	14.54	48	15.2	42.5	15.86	37	16.765	31.5
14.084	53.6	14.528	48.1	15.188	42.6	15.848	37.1	16.746	31.6
14.078	53.7	14.516	48.2	15.176	42.7	15.836	37.2	16.727	31.7
14.072	53.8	14.504	48.3	15.164	42.8	15.824	37.3	16.708	31.8
14.066	53.9	14.492	48.4	15.152	42.9	15.812	37.4	16.689	31.9
14.06	54	14.48	48.5	15.14	43	15.8	37.5	16.67	32
14.054	54.1	14.468	48.6	15.128	43.1	15.788	37.6	16.651	32.1
14.048	54.2	14.456	48.7	15.116	43.2	15.776	37.7	16.632	32.2
14.042	54.3	14.444	48.8	15.104	43.3	15.764	37.8	16.613	32.3
14.036	54.4	14.432	48.9	15.092	43.4	15.752	37.9	16.594	32.4
14.03	54.5	14.42	49	15.08	43.5	15.74	38	16.575	32.5
14.024	54.6	14.408	49.1	15.068	43.6	15.728	38.1	16.556	32.6
14.018	54.7	14.396	49.2	15.056	43.7	15.716	38.2	16.537	32.7
14.012	54.8	14.384	49.3	15.044	43.8	15.704	38.3	16.518	32.8
14.006	54.9	14.372	49.4	15.032	43.9	15.692	38.4	16.499	32.9
14	55	14.36	49.5	15.02	44	15.68	38.5	16.48	33
13.994	55.1	14.348	49.6	15.008	44.1	15.668	38.6	16.461	33.1
13.988	55.2	14.336	49.7	14.996	44.2	15.656	38.7	16.442	33.2
13.982	55.3	14.324	49.8	14.984	44.3	15.644	38.8	16.423	33.3
13.976	55.4	14.312	49.9	14.972	44.4	15.632	38.9	16.404	33.4
13.97	55.5	14.3	50	14.96	44.5	15.62	39	16.385	33.5
13.964	55.6	14.294	50.1	14.948	44.6	15.608	39.1	16.366	33.6
13.958	55.7	14.288	50.2	14.936	44.7	15.596	39.2	16.347	33.7
13.952	55.8	14.282	50.3	14.924	44.8	15.584	39.3	16.328	33.8
13.946	55.9	14.276	50.4	14.912	44.9	15.572	39.4	16.309	33.9
13.94	56	14.27	50.5	14.9	45	15.56	39.5	16.29	34
13.934	56.1	14.264	50.6	14.888	45.1	15.548	39.6	16.271	34.1
13.928	56.2	14.258	50.7	14.876	45.2	15.536	39.7	16.252	34.2
13.922	56.3	14.252	50.8	14.864	45.3	15.524	39.8	16.233	34.3
13.916	56.4	14.246	50.9	14.852	45.4	15.512	39.9	16.214	34.4
13.91	56.5	14.24	51	14.84	45.5	15.5	40	16.195	34.5
13.904	56.6	14.234	51.1	14.828	45.6	15.488	40.1	16.176	34.6
13.898	56.7	14.228	51.2	14.816	45.7	15.476	40.2	16.157	34.7
13.892	56.8	14.222	51.3	14.804	45.8	15.464	40.3	16.138	34.8
13.886	56.9	14.216	51.4	14.792	45.9	15.452	40.4	16.119	34.9
13.88	57	14.21	51.5	14.78	46	15.44	40.5	16.1	35
13.874	57.1	14.204	51.6	14.768	46.1	15.428	40.6	16.088	35.1
13.868	57.2	14.198	51.7	14.756	46.2	15.416	40.7	16.076	35.2
13.862	57.3	14.192	51.8	14.744	46.3	15.404	40.8	16.064	35.3
13.856	57.4	14.186	51.9	14.732	46.4	15.392	40.9	16.052	35.4
13.85	57.5	14.18	52	14.72	46.5	15.38	41	16.04	35.5
13.844	57.6	14.174	52.1	14.708	46.6	15.368	41.1	16.028	35.6
13.838	57.7	14.168	52.2	14.696	46.7	15.356	41.2	16.016	35.7
13.832	57.8	14.162	52.3	14.684	46.8	15.344	41.3	16.004	35.8
13.826	57.9	14.156	52.4	14.672	46.9	15.332	41.4	15.992	35.9

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
12.5	80	12.83	74.5	13.16	69	13.49	63.5	13.82	58
12.494	80.1	12.824	74.6	13.154	69.1	13.484	63.6	13.814	58.1
12.488	80.2	12.818	74.7	13.148	69.2	13.478	63.7	13.808	58.2
12.482	80.3	12.812	74.8	13.142	69.3	13.472	63.8	13.802	58.3
12.476	80.4	12.806	74.9	13.136	69.4	13.466	63.9	13.796	58.4
12.47	80.5	12.8	75	13.13	69.5	13.46	64	13.79	58.5
12.464	80.6	12.794	75.1	13.124	69.6	13.454	64.1	13.784	58.6
12.458	80.7	12.788	75.2	13.118	69.7	13.448	64.2	13.778	58.7
12.452	80.8	12.782	75.3	13.112	69.8	13.442	64.3	13.772	58.8
12.446	80.9	12.776	75.4	13.106	69.9	13.436	64.4	13.766	58.9
12.44	81	12.77	75.5	13.1	70	13.43	64.5	13.76	59
12.434	81.1	12.764	75.6	13.094	70.1	13.424	64.6	13.754	59.1
12.428	81.2	12.758	75.7	13.088	70.2	13.418	64.7	13.748	59.2
12.422	81.3	12.752	75.8	13.082	70.3	13.412	64.8	13.742	59.3
12.416	81.4	12.746	75.9	13.076	70.4	13.406	64.9	13.736	59.4
12.41	81.5	12.74	76	13.07	70.5	13.4	65	13.73	59.5
12.404	81.6	12.734	76.1	13.064	70.6	13.394	65.1	13.724	59.6
12.398	81.7	12.728	76.2	13.058	70.7	13.388	65.2	13.718	59.7
12.392	81.8	12.722	76.3	13.052	70.8	13.382	65.3	13.712	59.8
12.386	81.9	12.716	76.4	13.046	70.9	13.376	65.4	13.706	59.9
12.38	82	12.71	76.5	13.04	71	13.37	65.5	13.7	60
12.374	82.1	12.704	76.6	13.034	71.1	13.364	65.6	13.694	60.1
12.368	82.2	12.698	76.7	13.028	71.2	13.358	65.7	13.688	60.2
12.362	82.3	12.692	76.8	13.022	71.3	13.352	65.8	13.682	60.3
12.356	82.4	12.686	76.9	13.016	71.4	13.346	65.9	13.676	60.4
12.35	82.5	12.68	77	13.01	71.5	13.34	66	13.67	60.5
12.344	82.6	12.674	77.1	13.004	71.6	13.334	66.1	13.664	60.6
12.338	82.7	12.668	77.2	12.998	71.7	13.328	66.2	13.658	60.7
12.332	82.8	12.662	77.3	12.992	71.8	13.322	66.3	13.652	60.8
12.326	82.9	12.656	77.4	12.986	71.9	13.316	66.4	13.646	60.9
12.32	83	12.65	77.5	12.98	72	13.31	66.5	13.64	61
12.314	83.1	12.644	77.6	12.974	72.1	13.304	66.6	13.634	61.1
12.308	83.2	12.638	77.7	12.968	72.2	13.298	66.7	13.628	61.2
12.302	83.3	12.632	77.8	12.962	72.3	13.292	66.8	13.622	61.3
12.296	83.4	12.626	77.9	12.956	72.4	13.286	66.9	13.616	61.4
12.29	83.5	12.62	78	12.95	72.5	13.28	67	13.61	61.5
12.284	83.6	12.614	78.1	12.944	72.6	13.274	67.1	13.604	61.6
12.278	83.7	12.608	78.2	12.938	72.7	13.268	67.2	13.598	61.7
12.272	83.8	12.602	78.3	12.932	72.8	13.262	67.3	13.592	61.8
12.266	83.9	12.596	78.4	12.926	72.9	13.256	67.4	13.586	61.9
12.26	84	12.59	78.5	12.92	73	13.25	67.5	13.58	62
12.254	84.1	12.584	78.6	12.914	73.1	13.244	67.6	13.574	62.1
12.248	84.2	12.578	78.7	12.908	73.2	13.238	67.7	13.568	62.2
12.242	84.3	12.572	78.8	12.902	73.3	13.232	67.8	13.562	62.3
12.236	84.4	12.566	78.9	12.896	73.4	13.226	67.9	13.556	62.4
12.23	84.5	12.56	79	12.89	73.5	13.22	68	13.55	62.5
12.224	84.6	12.554	79.1	12.884	73.6	13.214	68.1	13.544	62.6
12.218	84.7	12.548	79.2	12.878	73.7	13.208	68.2	13.538	62.7
12.212	84.8	12.542	79.3	12.872	73.8	13.202	68.3	13.532	62.8
12.206	84.9	12.536	79.4	12.866	73.9	13.196	68.4	13.526	62.9
12.2	85	12.53	79.5	12.86	74	13.19	68.5	13.52	63
12.194	85.1	12.524	79.6	12.854	74.1	13.184	68.6	13.514	63.1
12.188	85.2	12.518	79.7	12.848	74.2	13.178	68.7	13.508	63.2
12.182	85.3	12.512	79.8	12.842	74.3	13.172	68.8	13.502	63.3
12.176	85.4	12.506	79.9	12.836	74.4	13.166	68.9	13.496	63.4

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
11.09	107.5	11.244	102	11.51	96.5	11.84	91	12.17	85.5
11.0872	107.6	11.2412	102.1	11.504	96.6	11.834	91.1	12.164	85.6
11.0844	107.7	11.2384	102.2	11.498	96.7	11.828	91.2	12.158	85.7
11.0816	107.8	11.2356	102.3	11.492	96.8	11.822	91.3	12.152	85.8
11.0788	107.9	11.2328	102.4	11.486	96.9	11.816	91.4	12.146	85.9
11.076	108	11.23	102.5	11.48	97	11.81	91.5	12.14	86
11.0732	108.1	11.2272	102.6	11.474	97.1	11.804	91.6	12.134	86.1
11.0704	108.2	11.2244	102.7	11.468	97.2	11.798	91.7	12.128	86.2
11.0676	108.3	11.2216	102.8	11.462	97.3	11.792	91.8	12.122	86.3
11.0648	108.4	11.2188	102.9	11.456	97.4	11.786	91.9	12.116	86.4
11.062	108.5	11.216	103	11.45	97.5	11.78	92	12.11	86.5
11.0592	108.6	11.2132	103.1	11.444	97.6	11.774	92.1	12.104	86.6
11.0564	108.7	11.2104	103.2	11.438	97.7	11.768	92.2	12.098	86.7
11.0536	108.8	11.2076	103.3	11.432	97.8	11.762	92.3	12.092	86.8
11.0508	108.9	11.2048	103.4	11.426	97.9	11.756	92.4	12.086	86.9
11.048	109	11.202	103.5	11.42	98	11.75	92.5	12.08	87
11.0452	109.1	11.1992	103.6	11.414	98.1	11.744	92.6	12.074	87.1
11.0424	109.2	11.1964	103.7	11.408	98.2	11.738	92.7	12.068	87.2
11.0396	109.3	11.1936	103.8	11.402	98.3	11.732	92.8	12.062	87.3
11.0368	109.4	11.1908	103.9	11.396	98.4	11.726	92.9	12.056	87.4
11.034	109.5	11.188	104	11.39	98.5	11.72	93	12.05	87.5
11.0312	109.6	11.1852	104.1	11.384	98.6	11.714	93.1	12.044	87.6
11.0284	109.7	11.1824	104.2	11.378	98.7	11.708	93.2	12.038	87.7
11.0256	109.8	11.1796	104.3	11.372	98.8	11.702	93.3	12.032	87.8
11.0228	109.9	11.1768	104.4	11.366	98.9	11.696	93.4	12.026	87.9
11.02	110	11.174	104.5	11.36	99	11.69	93.5	12.02	88
11.0172	110.1	11.1712	104.6	11.354	99.1	11.684	93.6	12.014	88.1
11.0144	110.2	11.1684	104.7	11.348	99.2	11.678	93.7	12.008	88.2
11.0116	110.3	11.1656	104.8	11.342	99.3	11.672	93.8	12.002	88.3
11.0088	110.4	11.1628	104.9	11.336	99.4	11.666	93.9	11.996	88.4
11.006	110.5	11.16	105	11.33	99.5	11.66	94	11.99	88.5
11.0032	110.6	11.1572	105.1	11.324	99.6	11.654	94.1	11.984	88.6
11.0004	110.7	11.1544	105.2	11.318	99.7	11.648	94.2	11.978	88.7
10.9976	110.8	11.1516	105.3	11.312	99.8	11.642	94.3	11.972	88.8
10.9948	110.9	11.1488	105.4	11.306	99.9	11.636	94.4	11.966	88.9
10.992	111	11.146	105.5	11.3	100	11.63	94.5	11.96	89
10.9892	111.1	11.1432	105.6	11.2972	100.1	11.624	94.6	11.954	89.1
10.9864	111.2	11.1404	105.7	11.2944	100.2	11.618	94.7	11.948	89.2
10.9836	111.3	11.1376	105.8	11.2916	100.3	11.612	94.8	11.942	89.3
10.9808	111.4	11.1348	105.9	11.2888	100.4	11.606	94.9	11.936	89.4
10.978	111.5	11.132	106	11.286	100.5	11.6	95	11.93	89.5
10.9752	111.6	11.1292	106.1	11.2832	100.6	11.594	95.1	11.924	89.6
10.9724	111.7	11.1264	106.2	11.2804	100.7	11.588	95.2	11.918	89.7
10.9696	111.8	11.1236	106.3	11.2776	100.8	11.582	95.3	11.912	89.8
10.9668	111.9	11.1208	106.4	11.2748	100.9	11.576	95.4	11.906	89.9
10.964	112	11.118	106.5	11.272	101	11.57	95.5	11.9	90
10.9612	112.1	11.1152	106.6	11.2692	101.1	11.564	95.6	11.894	90.1
10.9584	112.2	11.1124	106.7	11.2664	101.2	11.558	95.7	11.888	90.2
10.9556	112.3	11.1096	106.8	11.2636	101.3	11.552	95.8	11.882	90.3
10.9528	112.4	11.1068	106.9	11.2608	101.4	11.546	95.9	11.876	90.4
10.95	112.5	11.104	107	11.258	101.5	11.54	96	11.87	90.5
10.9472	112.6	11.1012	107.1	11.2552	101.6	11.534	96.1	11.864	90.6
10.9444	112.7	11.0984	107.2	11.2524	101.7	11.528	96.2	11.858	90.7
10.9416	112.8	11.0956	107.3	11.2496	101.8	11.522	96.3	11.852	90.8
10.9388	112.9	11.0928	107.4	11.2468	101.9	11.516	96.4	11.846	90.9

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
10.32	135	10.474	129.5	10.628	124	10.782	118.5	10.936	113
10.3172	135.1	10.4712	129.6	10.6252	124.1	10.7792	118.6	10.9332	113.1
10.3144	135.2	10.4684	129.7	10.6224	124.2	10.7764	118.7	10.9304	113.2
10.3116	135.3	10.4656	129.8	10.6196	124.3	10.7736	118.8	10.9276	113.3
10.3088	135.4	10.4628	129.9	10.6168	124.4	10.7708	118.9	10.9248	113.4
10.306	135.5	10.46	130	10.614	124.5	10.768	119	10.922	113.5
10.3032	135.6	10.4572	130.1	10.6112	124.6	10.7652	119.1	10.9192	113.6
10.3004	135.7	10.4544	130.2	10.6084	124.7	10.7624	119.2	10.9164	113.7
10.2976	135.8	10.4516	130.3	10.6056	124.8	10.7596	119.3	10.9136	113.8
10.2948	135.9	10.4488	130.4	10.6028	124.9	10.7568	119.4	10.9108	113.9
10.292	136	10.446	130.5	10.6	125	10.754	119.5	10.908	114
10.2892	136.1	10.4432	130.6	10.5972	125.1	10.7512	119.6	10.9052	114.1
10.2864	136.2	10.4404	130.7	10.5944	125.2	10.7484	119.7	10.9024	114.2
10.2836	136.3	10.4376	130.8	10.5916	125.3	10.7456	119.8	10.8996	114.3
10.2808	136.4	10.4348	130.9	10.5888	125.4	10.7428	119.9	10.8968	114.4
10.278	136.5	10.432	131	10.586	125.5	10.74	120	10.894	114.5
10.2752	136.6	10.4292	131.1	10.5832	125.6	10.7372	120.1	10.8912	114.6
10.2724	136.7	10.4264	131.2	10.5804	125.7	10.7344	120.2	10.8884	114.7
10.2696	136.8	10.4236	131.3	10.5776	125.8	10.7316	120.3	10.8856	114.8
10.2668	136.9	10.4208	131.4	10.5748	125.9	10.7288	120.4	10.8828	114.9
10.264	137	10.418	131.5	10.572	126	10.726	120.5	10.88	115
10.2612	137.1	10.4152	131.6	10.5692	126.1	10.7232	120.6	10.8772	115.1
10.2584	137.2	10.4124	131.7	10.5664	126.2	10.7204	120.7	10.8744	115.2
10.2556	137.3	10.4096	131.8	10.5636	126.3	10.7176	120.8	10.8716	115.3
10.2528	137.4	10.4068	131.9	10.5608	126.4	10.7148	120.9	10.8688	115.4
10.25	137.5	10.404	132	10.558	126.5	10.712	121	10.866	115.5
10.2472	137.6	10.4012	132.1	10.5552	126.6	10.7092	121.1	10.8632	115.6
10.2444	137.7	10.3984	132.2	10.5524	126.7	10.7064	121.2	10.8604	115.7
10.2416	137.8	10.3956	132.3	10.5496	126.8	10.7036	121.3	10.8576	115.8
10.2388	137.9	10.3928	132.4	10.5468	126.9	10.7008	121.4	10.8548	115.9
10.236	138	10.39	132.5	10.544	127	10.698	121.5	10.852	116
10.2332	138.1	10.3872	132.6	10.5412	127.1	10.6952	121.6	10.8492	116.1
10.2304	138.2	10.3844	132.7	10.5384	127.2	10.6924	121.7	10.8464	116.2
10.2276	138.3	10.3816	132.8	10.5356	127.3	10.6896	121.8	10.8436	116.3
10.2248	138.4	10.3788	132.9	10.5328	127.4	10.6868	121.9	10.8408	116.4
10.222	138.5	10.376	133	10.53	127.5	10.684	122	10.838	116.5
10.2192	138.6	10.3732	133.1	10.5272	127.6	10.6812	122.1	10.8352	116.6
10.2164	138.7	10.3704	133.2	10.5244	127.7	10.6784	122.2	10.8324	116.7
10.2136	138.8	10.3676	133.3	10.5216	127.8	10.6756	122.3	10.8296	116.8
10.2108	138.9	10.3648	133.4	10.5188	127.9	10.6728	122.4	10.8268	116.9
10.208	139	10.362	133.5	10.516	128	10.67	122.5	10.824	117
10.2052	139.1	10.3592	133.6	10.5132	128.1	10.6672	122.6	10.8212	117.1
10.2024	139.2	10.3564	133.7	10.5104	128.2	10.6644	122.7	10.8184	117.2
10.1996	139.3	10.3536	133.8	10.5076	128.3	10.6616	122.8	10.8156	117.3
10.1968	139.4	10.3508	133.9	10.5048	128.4	10.6588	122.9	10.8128	117.4
10.194	139.5	10.348	134	10.502	128.5	10.656	123	10.81	117.5
10.1912	139.6	10.3452	134.1	10.4992	128.6	10.6532	123.1	10.8072	117.6
10.1884	139.7	10.3424	134.2	10.4964	128.7	10.6504	123.2	10.8044	117.7
10.1856	139.8	10.3396	134.3	10.4936	128.8	10.6476	123.3	10.8016	117.8
10.1828	139.9	10.3368	134.4	10.4908	128.9	10.6448	123.4	10.7988	117.9
10.18	140	10.334	134.5	10.488	129	10.642	123.5	10.796	118
10.1772	140.1	10.3312	134.6	10.4852	129.1	10.6392	123.6	10.7932	118.1
10.1744	140.2	10.3284	134.7	10.4824	129.2	10.6364	123.7	10.7904	118.2
10.1716	140.3	10.3256	134.8	10.4796	129.3	10.6336	123.8	10.7876	118.3
10.1688	140.4	10.3228	134.9	10.4768	129.4	10.6308	123.9	10.7848	118.4

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
9.6858	161.9	9.7848	156.4			10.012	146	10.166	140.5
9.684	162	9.783	156.5			10.0092	146.1	10.1632	140.6
9.6822	162.1	9.7812	156.6			10.0064	146.2	10.1604	140.7
9.6804	162.2	9.7794	156.7			10.0036	146.3	10.1576	140.8
9.6786	162.3	9.7776	156.8			10.0008	146.4	10.1548	140.9
9.6768	162.4	9.7758	156.9			9.998	146.5	10.152	141
9.675	162.5	9.774	157	9.873	151.5	9.9952	146.6	10.1492	141.1
9.6732	162.6	9.7722	157.1	9.8712	151.6	9.9924	146.7	10.1464	141.2
9.6714	162.7	9.7704	157.2	9.8694	151.7	9.9896	146.8	10.1436	141.3
9.6696	162.8	9.7686	157.3	9.8676	151.8	9.9868	146.9	10.1408	141.4
9.6678	162.9	9.7668	157.4	9.8658	151.9	9.984	147	10.138	141.5
9.666	163	9.765	157.5	9.864	152	9.9812	147.1	10.1352	141.6
9.6642	163.1	9.7632	157.6	9.8622	152.1	9.9784	147.2	10.1324	141.7
9.6624	163.2	9.7614	157.7	9.8604	152.2	9.9756	147.3	10.1296	141.8
9.6606	163.3	9.7596	157.8	9.8586	152.3	9.9728	147.4	10.1268	141.9
9.6588	163.4	9.7578	157.9	9.8568	152.4	9.97	147.5	10.124	142
9.657	163.5	9.756	158	9.855	152.5	9.9672	147.6	10.1212	142.1
9.6552	163.6	9.7542	158.1	9.8532	152.6	9.9644	147.7	10.1184	142.2
9.6534	163.7	9.7524	158.2	9.8514	152.7	9.9616	147.8	10.1156	142.3
9.6516	163.8	9.7506	158.3	9.8496	152.8	9.9588	147.9	10.1128	142.4
9.6498	163.9	9.7488	158.4	9.8478	152.9	9.956	148	10.11	142.5
9.648	164	9.747	158.5	9.846	153	9.9532	148.1	10.1072	142.6
9.6462	164.1	9.7452	158.6	9.8442	153.1	9.9504	148.2	10.1044	142.7
9.6444	164.2	9.7434	158.7	9.8424	153.2	9.9476	148.3	10.1016	142.8
9.6426	164.3	9.7416	158.8	9.8406	153.3	9.9448	148.4	10.0988	142.9
9.6408	164.4	9.7398	158.9	9.8388	153.4	9.942	148.5	10.096	143
9.639	164.5	9.738	159	9.837	153.5	9.9392	148.6	10.0932	143.1
9.6372	164.6	9.7362	159.1	9.8352	153.6	9.9364	148.7	10.0904	143.2
9.6354	164.7	9.7344	159.2	9.8334	153.7	9.9336	148.8	10.0876	143.3
9.6336	164.8	9.7326	159.3	9.8316	153.8	9.9308	148.9	10.0848	143.4
9.6318	164.9	9.7308	159.4	9.8298	153.9	9.928	149	10.082	143.5
9.63	165	9.729	159.5	9.828	154	9.9252	149.1	10.0792	143.6
9.6282	165.1	9.7272	159.6	9.8262	154.1	9.9224	149.2	10.0764	143.7
9.6264	165.2	9.7254	159.7	9.8244	154.2	9.9196	149.3	10.0736	143.8
9.6246	165.3	9.7236	159.8	9.8226	154.3	9.9168	149.4	10.0708	143.9
9.6228	165.4	9.7218	159.9	9.8208	154.4	9.914	149.5	10.068	144
9.621	165.5	9.72	160	9.819	154.5	9.9112	149.6	10.0652	144.1
9.6192	165.6	9.7182	160.1	9.8172	154.6	9.9084	149.7	10.0624	144.2
9.6174	165.7	9.7164	160.2	9.8154	154.7	9.9056	149.8	10.0596	144.3
9.6156	165.8	9.7146	160.3	9.8136	154.8	9.9028	149.9	10.0568	144.4
9.6138	165.9	9.7128	160.4	9.8118	154.9	9.9	150	10.054	144.5
9.612	166	9.711	160.5	9.81	155	9.8982	150.1	10.0512	144.6
9.6102	166.1	9.7092	160.6	9.8082	155.1	9.8964	150.2	10.0484	144.7
9.6084	166.2	9.7074	160.7	9.8064	155.2	9.8946	150.3	10.0456	144.8
9.6066	166.3	9.7056	160.8	9.8046	155.3	9.8928	150.4	10.0428	144.9
9.6048	166.4	9.7038	160.9	9.8028	155.4	9.891	150.5	10.04	145
9.603	166.5	9.702	161	9.801	155.5	9.8892	150.6	10.0372	145.1
9.6012	166.6	9.7002	161.1	9.7992	155.6	9.8874	150.7	10.0344	145.2
9.5994	166.7	9.6984	161.2	9.7974	155.7	9.8856	150.8	10.0316	145.3
9.5976	166.8	9.6966	161.3	9.7956	155.8	9.8838	150.9	10.0288	145.4
9.5958	166.9	9.6948	161.4	9.7938	155.9	9.882	151	10.026	145.5
9.594	167	9.693	161.5	9.792	156	9.8802	151.1	10.0232	145.6
9.5922	167.1	9.6912	161.6	9.7902	156.1	9.8784	151.2	10.0204	145.7
9.5904	167.2	9.6894	161.7	9.7884	156.2	9.8766	151.3	10.0176	145.8
9.5886	167.3	9.6876	161.8	9.7866	156.3	9.8748	151.4	10.0148	145.9

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
9.1908	189.4	9.2898	183.9	9.3888	178.4	9.4878	172.9	9.5868	167.4
9.189	189.5	9.288	184	9.387	178.5	9.486	173	9.585	167.5
9.1872	189.6	9.2862	184.1	9.3852	178.6	9.4842	173.1	9.5832	167.6
9.1854	189.7	9.2844	184.2	9.3834	178.7	9.4824	173.2	9.5814	167.7
9.1836	189.8	9.2826	184.3	9.3816	178.8	9.4806	173.3	9.5796	167.8
9.1818	189.9	9.2808	184.4	9.3798	178.9	9.4788	173.4	9.5778	167.9
9.18	190	9.279	184.5	9.378	179	9.477	173.5	9.576	168
9.1782	190.1	9.2772	184.6	9.3762	179.1	9.4752	173.6	9.5742	168.1
9.1764	190.2	9.2754	184.7	9.3744	179.2	9.4734	173.7	9.5724	168.2
9.1746	190.3	9.2736	184.8	9.3726	179.3	9.4716	173.8	9.5706	168.3
9.1728	190.4	9.2718	184.9	9.3708	179.4	9.4698	173.9	9.5688	168.4
9.171	190.5	9.27	185	9.369	179.5	9.468	174	9.567	168.5
9.1692	190.6	9.2682	185.1	9.3672	179.6	9.4662	174.1	9.5652	168.6
9.1674	190.7	9.2664	185.2	9.3654	179.7	9.4644	174.2	9.5634	168.7
9.1656	190.8	9.2646	185.3	9.3636	179.8	9.4626	174.3	9.5616	168.8
9.1638	190.9	9.2628	185.4	9.3618	179.9	9.4608	174.4	9.5598	168.9
9.162	191	9.261	185.5	9.36	180	9.459	174.5	9.558	169
9.1602	191.1	9.2592	185.6	9.3582	180.1	9.4572	174.6	9.5562	169.1
9.1584	191.2	9.2574	185.7	9.3564	180.2	9.4554	174.7	9.5544	169.2
9.1566	191.3	9.2556	185.8	9.3546	180.3	9.4536	174.8	9.5526	169.3
9.1548	191.4	9.2538	185.9	9.3528	180.4	9.4518	174.9	9.5508	169.4
9.153	191.5	9.252	186	9.351	180.5	9.45	175	9.549	169.5
9.1512	191.6	9.2502	186.1	9.3492	180.6	9.4482	175.1	9.5472	169.6
9.1494	191.7	9.2484	186.2	9.3474	180.7	9.4464	175.2	9.5454	169.7
9.1476	191.8	9.2466	186.3	9.3456	180.8	9.4446	175.3	9.5436	169.8
9.1458	191.9	9.2448	186.4	9.3438	180.9	9.4428	175.4	9.5418	169.9
9.144	192	9.243	186.5	9.342	181	9.441	175.5	9.54	170
9.1422	192.1	9.2412	186.6	9.3402	181.1	9.4392	175.6	9.5382	170.1
9.1404	192.2	9.2394	186.7	9.3384	181.2	9.4374	175.7	9.5364	170.2
9.1386	192.3	9.2376	186.8	9.3366	181.3	9.4356	175.8	9.5346	170.3
9.1368	192.4	9.2358	186.9	9.3348	181.4	9.4338	175.9	9.5328	170.4
9.135	192.5	9.234	187	9.333	181.5	9.432	176	9.531	170.5
9.1332	192.6	9.2322	187.1	9.3312	181.6	9.4302	176.1	9.5292	170.6
9.1314	192.7	9.2304	187.2	9.3294	181.7	9.4284	176.2	9.5274	170.7
9.1296	192.8	9.2286	187.3	9.3276	181.8	9.4266	176.3	9.5256	170.8
9.1278	192.9	9.2268	187.4	9.3258	181.9	9.4248	176.4	9.5238	170.9
9.126	193	9.225	187.5	9.324	182	9.423	176.5	9.522	171
9.1242	193.1	9.2232	187.6	9.3222	182.1	9.4212	176.6	9.5202	171.1
9.1224	193.2	9.2214	187.7	9.3204	182.2	9.4194	176.7	9.5184	171.2
9.1206	193.3	9.2196	187.8	9.3186	182.3	9.4176	176.8	9.5166	171.3
9.1188	193.4	9.2178	187.9	9.3168	182.4	9.4158	176.9	9.5148	171.4
9.117	193.5	9.216	188	9.315	182.5	9.414	177	9.513	171.5
9.1152	193.6	9.2142	188.1	9.3132	182.6	9.4122	177.1	9.5112	171.6
9.1134	193.7	9.2124	188.2	9.3114	182.7	9.4104	177.2	9.5094	171.7
9.1116	193.8	9.2106	188.3	9.3096	182.8	9.4086	177.3	9.5076	171.8
9.1098	193.9	9.2088	188.4	9.3078	182.9	9.4068	177.4	9.5058	171.9
9.108	194	9.207	188.5	9.306	183	9.405	177.5	9.504	172
9.1062	194.1	9.2052	188.6	9.3042	183.1	9.4032	177.6	9.5022	172.1
9.1044	194.2	9.2034	188.7	9.3024	183.2	9.4014	177.7	9.5004	172.2
9.1026	194.3	9.2016	188.8	9.3006	183.3	9.3996	177.8	9.4986	172.3
9.1008	194.4	9.1998	188.9	9.2988	183.4	9.3978	177.9	9.4968	172.4
9.099	194.5	9.198	189	9.297	183.5	9.396	178	9.495	172.5
9.0972	194.6	9.1962	189.1	9.2952	183.6	9.3942	178.1	9.4932	172.6
9.0954	194.7	9.1944	189.2	9.2934	183.7	9.3924	178.2	9.4914	172.7
9.0936	194.8	9.1926	189.3	9.2916	183.8	9.3906	178.3	9.4896	172.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
8.7972	216.9	8.8632	211.4	8.9292	205.9	8.9952	200.4	9.0918	194.9
8.796	217	8.862	211.5	8.928	206	8.994	200.5	9.09	195
8.7948	217.1	8.8608	211.6	8.9268	206.1	8.9928	200.6	9.0882	195.1
8.7936	217.2	8.8596	211.7	8.9256	206.2	8.9916	200.7	9.0864	195.2
8.7924	217.3	8.8584	211.8	8.9244	206.3	8.9904	200.8	9.0846	195.3
8.7912	217.4	8.8572	211.9	8.9232	206.4	8.9892	200.9	9.0828	195.4
8.79	217.5	8.856	212	8.922	206.5	8.988	201	9.081	195.5
8.7888	217.6	8.8548	212.1	8.9208	206.6	8.9868	201.1	9.0792	195.6
8.7876	217.7	8.8536	212.2	8.9196	206.7	8.9856	201.2	9.0774	195.7
8.7864	217.8	8.8524	212.3	8.9184	206.8	8.9844	201.3	9.0756	195.8
8.7852	217.9	8.8512	212.4	8.9172	206.9	8.9832	201.4	9.0738	195.9
8.784	218	8.85	212.5	8.916	207	8.982	201.5	9.072	196
8.7828	218.1	8.8488	212.6	8.9148	207.1	8.9808	201.6	9.0702	196.1
8.7816	218.2	8.8476	212.7	8.9136	207.2	8.9796	201.7	9.0684	196.2
8.7804	218.3	8.8464	212.8	8.9124	207.3	8.9784	201.8	9.0666	196.3
8.7792	218.4	8.8452	212.9	8.9112	207.4	8.9772	201.9	9.0648	196.4
8.778	218.5	8.844	213	8.91	207.5	8.976	202	9.063	196.5
8.7768	218.6	8.8428	213.1	8.9088	207.6	8.9748	202.1	9.0612	196.6
8.7756	218.7	8.8416	213.2	8.9076	207.7	8.9736	202.2	9.0594	196.7
8.7744	218.8	8.8404	213.3	8.9064	207.8	8.9724	202.3	9.0576	196.8
8.7732	218.9	8.8392	213.4	8.9052	207.9	8.9712	202.4	9.0558	196.9
8.772	219	8.838	213.5	8.904	208	8.97	202.5	9.054	197
8.7708	219.1	8.8368	213.6	8.9028	208.1	8.9688	202.6	9.0522	197.1
8.7696	219.2	8.8356	213.7	8.9016	208.2	8.9676	202.7	9.0504	197.2
8.7684	219.3	8.8344	213.8	8.9004	208.3	8.9664	202.8	9.0486	197.3
8.7672	219.4	8.8332	213.9	8.8992	208.4	8.9652	202.9	9.0468	197.4
8.766	219.5	8.832	214	8.898	208.5	8.964	203	9.045	197.5
8.7648	219.6	8.8308	214.1	8.8968	208.6	8.9628	203.1	9.0432	197.6
8.7636	219.7	8.8296	214.2	8.8956	208.7	8.9616	203.2	9.0414	197.7
8.7624	219.8	8.8284	214.3	8.8944	208.8	8.9604	203.3	9.0396	197.8
8.7612	219.9	8.8272	214.4	8.8932	208.9	8.9592	203.4	9.0378	197.9
8.76	220	8.826	214.5	8.892	209	8.958	203.5	9.036	198
8.7588	220.1	8.8248	214.6	8.8908	209.1	8.9568	203.6	9.0342	198.1
8.7576	220.2	8.8236	214.7	8.8896	209.2	8.9556	203.7	9.0324	198.2
8.7564	220.3	8.8224	214.8	8.8884	209.3	8.9544	203.8	9.0306	198.3
8.7552	220.4	8.8212	214.9	8.8872	209.4	8.9532	203.9	9.0288	198.4
8.754	220.5	8.82	215	8.886	209.5	8.952	204	9.027	198.5
8.7528	220.6	8.8188	215.1	8.8848	209.6	8.9508	204.1	9.0252	198.6
8.7516	220.7	8.8176	215.2	8.8836	209.7	8.9496	204.2	9.0234	198.7
8.7504	220.8	8.8164	215.3	8.8824	209.8	8.9484	204.3	9.0216	198.8
8.7492	220.9	8.8152	215.4	8.8812	209.9	8.9472	204.4	9.0198	198.9
8.748	221	8.814	215.5	8.88	210	8.946	204.5	9.018	199
8.7468	221.1	8.8128	215.6	8.8788	210.1	8.9448	204.6	9.0162	199.1
8.7456	221.2	8.8116	215.7	8.8776	210.2	8.9436	204.7	9.0144	199.2
8.7444	221.3	8.8104	215.8	8.8764	210.3	8.9424	204.8	9.0126	199.3
8.7432	221.4	8.8092	215.9	8.8752	210.4	8.9412	204.9	9.0108	199.4
8.742	221.5	8.808	216	8.874	210.5	8.94	205	9.009	199.5
8.7408	221.6	8.8068	216.1	8.8728	210.6	8.9388	205.1	9.0072	199.6
8.7396	221.7	8.8056	216.2	8.8716	210.7	8.9376	205.2	9.0054	199.7
8.7384	221.8	8.8044	216.3	8.8704	210.8	8.9364	205.3	9.0036	199.8
8.7372	221.9	8.8032	216.4	8.8692	210.9	8.9352	205.4	9.0018	199.9
8.736	222	8.802	216.5	8.868	211	8.934	205.5	9	200
8.7348	222.1	8.8008	216.6	8.8668	211.1	8.9328	205.6	8.9988	200.1
8.7336	222.2	8.7996	216.7	8.8656	211.2	8.9316	205.7	8.9976	200.2
8.7324	222.3	8.7984	216.8	8.8644	211.3	8.9304	205.8	8.9964	200.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
8.4672	244.4	8.5332	238.9	8.5992	233.4	8.6652	227.9	8.7312	222.4
8.466	244.5	8.532	239	8.598	233.5	8.664	228	8.73	222.5
8.4648	244.6	8.5308	239.1	8.5968	233.6	8.6628	228.1	8.7288	222.6
8.4636	244.7	8.5296	239.2	8.5956	233.7	8.6616	228.2	8.7276	222.7
8.4624	244.8	8.5284	239.3	8.5944	233.8	8.6604	228.3	8.7264	222.8
8.4612	244.9	8.5272	239.4	8.5932	233.9	8.6592	228.4	8.7252	222.9
8.46	245	8.526	239.5	8.592	234	8.658	228.5	8.724	223
8.4588	245.1	8.5248	239.6	8.5908	234.1	8.6568	228.6	8.7228	223.1
8.4576	245.2	8.5236	239.7	8.5896	234.2	8.6556	228.7	8.7216	223.2
8.4564	245.3	8.5224	239.8	8.5884	234.3	8.6544	228.8	8.7204	223.3
8.4552	245.4	8.5212	239.9	8.5872	234.4	8.6532	228.9	8.7192	223.4
8.454	245.5	8.52	240	8.586	234.5	8.652	229	8.718	223.5
8.4528	245.6	8.5188	240.1	8.5848	234.6	8.6508	229.1	8.7168	223.6
8.4516	245.7	8.5176	240.2	8.5836	234.7	8.6496	229.2	8.7156	223.7
8.4504	245.8	8.5164	240.3	8.5824	234.8	8.6484	229.3	8.7144	223.8
8.4492	245.9	8.5152	240.4	8.5812	234.9	8.6472	229.4	8.7132	223.9
8.448	246	8.514	240.5	8.58	235	8.646	229.5	8.712	224
8.4468	246.1	8.5128	240.6	8.5788	235.1	8.6448	229.6	8.7108	224.1
8.4456	246.2	8.5116	240.7	8.5776	235.2	8.6436	229.7	8.7096	224.2
8.4444	246.3	8.5104	240.8	8.5764	235.3	8.6424	229.8	8.7084	224.3
8.4432	246.4	8.5092	240.9	8.5752	235.4	8.6412	229.9	8.7072	224.4
8.442	246.5	8.508	241	8.574	235.5	8.64	230	8.706	224.5
8.4408	246.6	8.5068	241.1	8.5728	235.6	8.6388	230.1	8.7048	224.6
8.4396	246.7	8.5056	241.2	8.5716	235.7	8.6376	230.2	8.7036	224.7
8.4384	246.8	8.5044	241.3	8.5704	235.8	8.6364	230.3	8.7024	224.8
8.4372	246.9	8.5032	241.4	8.5692	235.9	8.6352	230.4	8.7012	224.9
8.436	247	8.502	241.5	8.568	236	8.634	230.5	8.7	225
8.4348	247.1	8.5008	241.6	8.5668	236.1	8.6328	230.6	8.6988	225.1
8.4336	247.2	8.4996	241.7	8.5656	236.2	8.6316	230.7	8.6976	225.2
8.4324	247.3	8.4984	241.8	8.5644	236.3	8.6304	230.8	8.6964	225.3
8.4312	247.4	8.4972	241.9	8.5632	236.4	8.6292	230.9	8.6952	225.4
8.43	247.5	8.496	242	8.562	236.5	8.628	231	8.694	225.5
8.4288	247.6	8.4948	242.1	8.5608	236.6	8.6268	231.1	8.6928	225.6
8.4276	247.7	8.4936	242.2	8.5596	236.7	8.6256	231.2	8.6916	225.7
8.4264	247.8	8.4924	242.3	8.5584	236.8	8.6244	231.3	8.6904	225.8
8.4252	247.9	8.4912	242.4	8.5572	236.9	8.6232	231.4	8.6892	225.9
8.424	248	8.49	242.5	8.556	237	8.622	231.5	8.688	226
8.4228	248.1	8.4888	242.6	8.5548	237.1	8.6208	231.6	8.6868	226.1
8.4216	248.2	8.4876	242.7	8.5536	237.2	8.6196	231.7	8.6856	226.2
8.4204	248.3	8.4864	242.8	8.5524	237.3	8.6184	231.8	8.6844	226.3
8.4192	248.4	8.4852	242.9	8.5512	237.4	8.6172	231.9	8.6832	226.4
8.418	248.5	8.484	243	8.55	237.5	8.616	232	8.682	226.5
8.4168	248.6	8.4828	243.1	8.5488	237.6	8.6148	232.1	8.6808	226.6
8.4156	248.7	8.4816	243.2	8.5476	237.7	8.6136	232.2	8.6796	226.7
8.4144	248.8	8.4804	243.3	8.5464	237.8	8.6124	232.3	8.6784	226.8
8.4132	248.9	8.4792	243.4	8.5452	237.9	8.6112	232.4	8.6772	226.9
8.412	249	8.478	243.5	8.544	238	8.61	232.5	8.676	227
8.4108	249.1	8.4768	243.6	8.5428	238.1	8.6088	232.6	8.6748	227.1
8.4096	249.2	8.4756	243.7	8.5416	238.2	8.6076	232.7	8.6736	227.2
8.4084	249.3	8.4744	243.8	8.5404	238.3	8.6064	232.8	8.6724	227.3
8.4072	249.4	8.4732	243.9	8.5392	238.4	8.6052	232.9	8.6712	227.4
8.406	249.5	8.472	244	8.538	238.5	8.604	233	8.67	227.5
8.4048	249.6	8.4708	244.1	8.5368	238.6	8.6028	233.1	8.6688	227.6
8.4036	249.7	8.4696	244.2	8.5356	238.7	8.6016	233.2	8.6676	227.7
8.4024	249.8	8.4684	244.3	8.5344	238.8	8.6004	233.3	8.6664	227.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
8.1372	271.9	8.2032	266.4	8.2692	260.9	8.3352	255.4	8.4012	249.9
8.136	272	8.202	266.5	8.268	261	8.334	255.5	8.4	250
8.1348	272.1	8.2008	266.6	8.2668	261.1	8.3328	255.6	8.3988	250.1
8.1336	272.2	8.1996	266.7	8.2656	261.2	8.3316	255.7	8.3976	250.2
8.1324	272.3	8.1984	266.8	8.2644	261.3	8.3304	255.8	8.3964	250.3
8.1312	272.4	8.1972	266.9	8.2632	261.4	8.3292	255.9	8.3952	250.4
8.13	272.5	8.196	267	8.262	261.5	8.328	256	8.394	250.5
8.1288	272.6	8.1948	267.1	8.2608	261.6	8.3268	256.1	8.3928	250.6
8.1276	272.7	8.1936	267.2	8.2596	261.7	8.3256	256.2	8.3916	250.7
8.1264	272.8	8.1924	267.3	8.2584	261.8	8.3244	256.3	8.3904	250.8
8.1252	272.9	8.1912	267.4	8.2572	261.9	8.3232	256.4	8.3892	250.9
8.124	273	8.19	267.5	8.256	262	8.322	256.5	8.388	251
8.1228	273.1	8.1888	267.6	8.2548	262.1	8.3208	256.6	8.3868	251.1
8.1216	273.2	8.1876	267.7	8.2536	262.2	8.3196	256.7	8.3856	251.2
8.1204	273.3	8.1864	267.8	8.2524	262.3	8.3184	256.8	8.3844	251.3
8.1192	273.4	8.1852	267.9	8.2512	262.4	8.3172	256.9	8.3832	251.4
8.118	273.5	8.184	268	8.25	262.5	8.316	257	8.382	251.5
8.1168	273.6	8.1828	268.1	8.2488	262.6	8.3148	257.1	8.3808	251.6
8.1156	273.7	8.1816	268.2	8.2476	262.7	8.3136	257.2	8.3796	251.7
8.1144	273.8	8.1804	268.3	8.2464	262.8	8.3124	257.3	8.3784	251.8
8.1132	273.9	8.1792	268.4	8.2452	262.9	8.3112	257.4	8.3772	251.9
8.112	274	8.178	268.5	8.244	263	8.31	257.5	8.376	252
8.1108	274.1	8.1768	268.6	8.2428	263.1	8.3088	257.6	8.3748	252.1
8.1096	274.2	8.1756	268.7	8.2416	263.2	8.3076	257.7	8.3736	252.2
8.1084	274.3	8.1744	268.8	8.2404	263.3	8.3064	257.8	8.3724	252.3
8.1072	274.4	8.1732	268.9	8.2392	263.4	8.3052	257.9	8.3712	252.4
8.106	274.5	8.172	269	8.238	263.5	8.304	258	8.37	252.5
8.1048	274.6	8.1708	269.1	8.2368	263.6	8.3028	258.1	8.3688	252.6
8.1036	274.7	8.1696	269.2	8.2356	263.7	8.3016	258.2	8.3676	252.7
8.1024	274.8	8.1684	269.3	8.2344	263.8	8.3004	258.3	8.3664	252.8
8.1012	274.9	8.1672	269.4	8.2332	263.9	8.2992	258.4	8.3652	252.9
8.1	275	8.166	269.5	8.232	264	8.298	258.5	8.364	253
8.0988	275.1	8.1648	269.6	8.2308	264.1	8.2968	258.6	8.3628	253.1
8.0976	275.2	8.1636	269.7	8.2296	264.2	8.2956	258.7	8.3616	253.2
8.0964	275.3	8.1624	269.8	8.2284	264.3	8.2944	258.8	8.3604	253.3
8.0952	275.4	8.1612	269.9	8.2272	264.4	8.2932	258.9	8.3592	253.4
8.094	275.5	8.16	270	8.226	264.5	8.292	259	8.358	253.5
8.0928	275.6	8.1588	270.1	8.2248	264.6	8.2908	259.1	8.3568	253.6
8.0916	275.7	8.1576	270.2	8.2236	264.7	8.2896	259.2	8.3556	253.7
8.0904	275.8	8.1564	270.3	8.2224	264.8	8.2884	259.3	8.3544	253.8
8.0892	275.9	8.1552	270.4	8.2212	264.9	8.2872	259.4	8.3532	253.9
8.088	276	8.154	270.5	8.22	265	8.286	259.5	8.352	254
8.0868	276.1	8.1528	270.6	8.2188	265.1	8.2848	259.6	8.3508	254.1
8.0856	276.2	8.1516	270.7	8.2176	265.2	8.2836	259.7	8.3496	254.2
8.0844	276.3	8.1504	270.8	8.2164	265.3	8.2824	259.8	8.3484	254.3
8.0832	276.4	8.1492	270.9	8.2152	265.4	8.2812	259.9	8.3472	254.4
8.082	276.5	8.148	271	8.214	265.5	8.28	260	8.346	254.5
8.0808	276.6	8.1468	271.1	8.2128	265.6	8.2788	260.1	8.3448	254.6
8.0796	276.7	8.1456	271.2	8.2116	265.7	8.2776	260.2	8.3436	254.7
8.0784	276.8	8.1444	271.3	8.2104	265.8	8.2764	260.3	8.3424	254.8
8.0772	276.9	8.1432	271.4	8.2092	265.9	8.2752	260.4	8.3412	254.9
8.076	277	8.142	271.5	8.208	266	8.274	260.5	8.34	255
8.0748	277.1	8.1408	271.6	8.2068	266.1	8.2728	260.6	8.3388	255.1
8.0736	277.2	8.1396	271.7	8.2056	266.2	8.2716	260.7	8.3376	255.2
8.0724	277.3	8.1384	271.8	8.2044	266.3	8.2704	260.8	8.3364	255.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
7.8072	299.4	7.8732	293.9	7.9392	288.4	8.0052	282.9	8.0712	277.4
7.806	299.5	7.872	294	7.938	288.5	8.004	283	8.07	277.5
7.8048	299.6	7.8708	294.1	7.9368	288.6	8.0028	283.1	8.0688	277.6
7.8036	299.7	7.8696	294.2	7.9356	288.7	8.0016	283.2	8.0676	277.7
7.8024	299.8	7.8684	294.3	7.9344	288.8	8.0004	283.3	8.0664	277.8
7.8012	299.9	7.8672	294.4	7.9332	288.9	7.9992	283.4	8.0652	277.9
7.8	300	7.866	294.5	7.932	289	7.998	283.5	8.064	278
7.7994	300.1	7.8648	294.6	7.9308	289.1	7.9968	283.6	8.0628	278.1
7.7988	300.2	7.8636	294.7	7.9296	289.2	7.9956	283.7	8.0616	278.2
7.7982	300.3	7.8624	294.8	7.9284	289.3	7.9944	283.8	8.0604	278.3
7.7976	300.4	7.8612	294.9	7.9272	289.4	7.9932	283.9	8.0592	278.4
7.797	300.5	7.86	295	7.926	289.5	7.992	284	8.058	278.5
7.7964	300.6	7.8588	295.1	7.9248	289.6	7.9908	284.1	8.0568	278.6
7.7958	300.7	7.8576	295.2	7.9236	289.7	7.9896	284.2	8.0556	278.7
7.7952	300.8	7.8564	295.3	7.9224	289.8	7.9884	284.3	8.0544	278.8
7.7946	300.9	7.8552	295.4	7.9212	289.9	7.9872	284.4	8.0532	278.9
7.794	301	7.854	295.5	7.92	290	7.986	284.5	8.052	279
7.7934	301.1	7.8528	295.6	7.9188	290.1	7.9848	284.6	8.0508	279.1
7.7928	301.2	7.8516	295.7	7.9176	290.2	7.9836	284.7	8.0496	279.2
7.7922	301.3	7.8504	295.8	7.9164	290.3	7.9824	284.8	8.0484	279.3
7.7916	301.4	7.8492	295.9	7.9152	290.4	7.9812	284.9	8.0472	279.4
7.791	301.5	7.848	296	7.914	290.5	7.98	285	8.046	279.5
7.7904	301.6	7.8468	296.1	7.9128	290.6	7.9788	285.1	8.0448	279.6
7.7898	301.7	7.8456	296.2	7.9116	290.7	7.9776	285.2	8.0436	279.7
7.7892	301.8	7.8444	296.3	7.9104	290.8	7.9764	285.3	8.0424	279.8
7.7886	301.9	7.8432	296.4	7.9092	290.9	7.9752	285.4	8.0412	279.9
7.788	302	7.842	296.5	7.908	291	7.974	285.5	8.04	280
7.7874	302.1	7.8408	296.6	7.9068	291.1	7.9728	285.6	8.0388	280.1
7.7868	302.2	7.8396	296.7	7.9056	291.2	7.9716	285.7	8.0376	280.2
7.7862	302.3	7.8384	296.8	7.9044	291.3	7.9704	285.8	8.0364	280.3
7.7856	302.4	7.8372	296.9	7.9032	291.4	7.9692	285.9	8.0352	280.4
7.785	302.5	7.836	297	7.902	291.5	7.968	286	8.034	280.5
7.7844	302.6	7.8348	297.1	7.9008	291.6	7.9668	286.1	8.0328	280.6
7.7838	302.7	7.8336	297.2	7.8996	291.7	7.9656	286.2	8.0316	280.7
7.7832	302.8	7.8324	297.3	7.8984	291.8	7.9644	286.3	8.0304	280.8
7.7826	302.9	7.8312	297.4	7.8972	291.9	7.9632	286.4	8.0292	280.9
7.782	303	7.83	297.5	7.896	292	7.962	286.5	8.028	281
7.7814	303.1	7.8288	297.6	7.8948	292.1	7.9608	286.6	8.0268	281.1
7.7808	303.2	7.8276	297.7	7.8936	292.2	7.9596	286.7	8.0256	281.2
7.7802	303.3	7.8264	297.8	7.8924	292.3	7.9584	286.8	8.0244	281.3
7.7796	303.4	7.8252	297.9	7.8912	292.4	7.9572	286.9	8.0232	281.4
7.779	303.5	7.824	298	7.89	292.5	7.956	287	8.022	281.5
7.7784	303.6	7.8228	298.1	7.8888	292.6	7.9548	287.1	8.0208	281.6
7.7778	303.7	7.8216	298.2	7.8876	292.7	7.9536	287.2	8.0196	281.7
7.7772	303.8	7.8204	298.3	7.8864	292.8	7.9524	287.3	8.0184	281.8
7.7766	303.9	7.8192	298.4	7.8852	292.9	7.9512	287.4	8.0172	281.9
7.776	304	7.818	298.5	7.884	293	7.95	287.5	8.016	282
7.7754	304.1	7.8168	298.6	7.8828	293.1	7.9488	287.6	8.0148	282.1
7.7748	304.2	7.8156	298.7	7.8816	293.2	7.9476	287.7	8.0136	282.2
7.7742	304.3	7.8144	298.8	7.8804	293.3	7.9464	287.8	8.0124	282.3
7.7736	304.4	7.8132	298.9	7.8792	293.4	7.9452	287.9	8.0112	282.4
7.773	304.5	7.812	299	7.878	293.5	7.944	288	8.01	282.5
7.7724	304.6	7.8108	299.1	7.8768	293.6	7.9428	288.1	8.0088	282.6
7.7718	304.7	7.8096	299.2	7.8756	293.7	7.9416	288.2	8.0076	282.7
7.7712	304.8	7.8084	299.3	7.8744	293.8	7.9404	288.3	8.0064	282.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
7.6386	326.9	7.6716	321.4	7.7046	315.9	7.7376	310.4	7.7706	304.9
7.638	327	7.671	321.5	7.704	316	7.737	310.5	7.77	305
7.6374	327.1	7.6704	321.6	7.7034	316.1	7.7364	310.6	7.7694	305.1
7.6368	327.2	7.6698	321.7	7.7028	316.2	7.7358	310.7	7.7688	305.2
7.6362	327.3	7.6692	321.8	7.7022	316.3	7.7352	310.8	7.7682	305.3
7.6356	327.4	7.6686	321.9	7.7016	316.4	7.7346	310.9	7.7676	305.4
7.635	327.5	7.668	322	7.701	316.5	7.734	311	7.767	305.5
7.6344	327.6	7.6674	322.1	7.7004	316.6	7.7334	311.1	7.7664	305.6
7.6338	327.7	7.6668	322.2	7.6998	316.7	7.7328	311.2	7.7658	305.7
7.6332	327.8	7.6662	322.3	7.6992	316.8	7.7322	311.3	7.7652	305.8
7.6326	327.9	7.6656	322.4	7.6986	316.9	7.7316	311.4	7.7646	305.9
7.632	328	7.665	322.5	7.698	317	7.731	311.5	7.764	306
7.6314	328.1	7.6644	322.6	7.6974	317.1	7.7304	311.6	7.7634	306.1
7.6308	328.2	7.6638	322.7	7.6968	317.2	7.7298	311.7	7.7628	306.2
7.6302	328.3	7.6632	322.8	7.6962	317.3	7.7292	311.8	7.7622	306.3
7.6296	328.4	7.6626	322.9	7.6956	317.4	7.7286	311.9	7.7616	306.4
7.629	328.5	7.662	323	7.695	317.5	7.728	312	7.761	306.5
7.6284	328.6	7.6614	323.1	7.6944	317.6	7.7274	312.1	7.7604	306.6
7.6278	328.7	7.6608	323.2	7.6938	317.7	7.7268	312.2	7.7598	306.7
7.6272	328.8	7.6602	323.3	7.6932	317.8	7.7262	312.3	7.7592	306.8
7.6266	328.9	7.6596	323.4	7.6926	317.9	7.7256	312.4	7.7586	306.9
7.626	329	7.659	323.5	7.692	318	7.725	312.5	7.758	307
7.6254	329.1	7.6584	323.6	7.6914	318.1	7.7244	312.6	7.7574	307.1
7.6248	329.2	7.6578	323.7	7.6908	318.2	7.7238	312.7	7.7568	307.2
7.6242	329.3	7.6572	323.8	7.6902	318.3	7.7232	312.8	7.7562	307.3
7.6236	329.4	7.6566	323.9	7.6896	318.4	7.7226	312.9	7.7556	307.4
7.623	329.5	7.656	324	7.689	318.5	7.722	313	7.755	307.5
7.6224	329.6	7.6554	324.1	7.6884	318.6	7.7214	313.1	7.7544	307.6
7.6218	329.7	7.6548	324.2	7.6878	318.7	7.7208	313.2	7.7538	307.7
7.6212	329.8	7.6542	324.3	7.6872	318.8	7.7202	313.3	7.7532	307.8
7.6206	329.9	7.6536	324.4	7.6866	318.9	7.7196	313.4	7.7526	307.9
7.62	330	7.653	324.5	7.686	319	7.719	313.5	7.752	308
7.6194	330.1	7.6524	324.6	7.6854	319.1	7.7184	313.6	7.7514	308.1
7.6188	330.2	7.6518	324.7	7.6848	319.2	7.7178	313.7	7.7508	308.2
7.6182	330.3	7.6512	324.8	7.6842	319.3	7.7172	313.8	7.7502	308.3
7.6176	330.4	7.6506	324.9	7.6836	319.4	7.7166	313.9	7.7496	308.4
7.617	330.5	7.65	325	7.683	319.5	7.716	314	7.749	308.5
7.6164	330.6	7.6494	325.1	7.6824	319.6	7.7154	314.1	7.7484	308.6
7.6158	330.7	7.6488	325.2	7.6818	319.7	7.7148	314.2	7.7478	308.7
7.6152	330.8	7.6482	325.3	7.6812	319.8	7.7142	314.3	7.7472	308.8
7.6146	330.9	7.6476	325.4	7.6806	319.9	7.7136	314.4	7.7466	308.9
7.614	331	7.647	325.5	7.68	320	7.713	314.5	7.746	309
7.6134	331.1	7.6464	325.6	7.6794	320.1	7.7124	314.6	7.7454	309.1
7.6128	331.2	7.6458	325.7	7.6788	320.2	7.7118	314.7	7.7448	309.2
7.6122	331.3	7.6452	325.8	7.6782	320.3	7.7112	314.8	7.7442	309.3
7.6116	331.4	7.6446	325.9	7.6776	320.4	7.7106	314.9	7.7436	309.4
7.611	331.5	7.644	326	7.677	320.5	7.71	315	7.743	309.5
7.6104	331.6	7.6434	326.1	7.6764	320.6	7.7094	315.1	7.7424	309.6
7.6098	331.7	7.6428	326.2	7.6758	320.7	7.7088	315.2	7.7418	309.7
7.6092	331.8	7.6422	326.3	7.6752	320.8	7.7082	315.3	7.7412	309.8
7.6086	331.9	7.6416	326.4	7.6746	320.9	7.7076	315.4	7.7406	309.9
7.608	332	7.641	326.5	7.674	321	7.707	315.5	7.74	310
7.6074	332.1	7.6404	326.6	7.6734	321.1	7.7064	315.6	7.7394	310.1
7.6068	332.2	7.6398	326.7	7.6728	321.2	7.7058	315.7	7.7388	310.2
7.6062	332.3	7.6392	326.8	7.6722	321.3	7.7052	315.8	7.7382	310.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
7.4736	354.4	7.5066	348.9	7.5396	343.4	7.5726	337.9	7.6056	332.4
7.473	354.5	7.506	349	7.539	343.5	7.572	338	7.605	332.5
7.4724	354.6	7.5054	349.1	7.5384	343.6	7.5714	338.1	7.6044	332.6
7.4718	354.7	7.5048	349.2	7.5378	343.7	7.5708	338.2	7.6038	332.7
7.4712	354.8	7.5042	349.3	7.5372	343.8	7.5702	338.3	7.6032	332.8
7.4706	354.9	7.5036	349.4	7.5366	343.9	7.5696	338.4	7.6026	332.9
7.47	355	7.503	349.5	7.536	344	7.569	338.5	7.602	333
7.4694	355.1	7.5024	349.6	7.5354	344.1	7.5684	338.6	7.6014	333.1
7.4688	355.2	7.5018	349.7	7.5348	344.2	7.5678	338.7	7.6008	333.2
7.4682	355.3	7.5012	349.8	7.5342	344.3	7.5672	338.8	7.6002	333.3
7.4676	355.4	7.5006	349.9	7.5336	344.4	7.5666	338.9	7.5996	333.4
7.467	355.5	7.5	350	7.533	344.5	7.566	339	7.599	333.5
7.4664	355.6	7.4994	350.1	7.5324	344.6	7.5654	339.1	7.5984	333.6
7.4658	355.7	7.4988	350.2	7.5318	344.7	7.5648	339.2	7.5978	333.7
7.4652	355.8	7.4982	350.3	7.5312	344.8	7.5642	339.3	7.5972	333.8
7.4646	355.9	7.4976	350.4	7.5306	344.9	7.5636	339.4	7.5966	333.9
7.464	356	7.497	350.5	7.53	345	7.563	339.5	7.596	334
7.4634	356.1	7.4964	350.6	7.5294	345.1	7.5624	339.6	7.5954	334.1
7.4628	356.2	7.4958	350.7	7.5288	345.2	7.5618	339.7	7.5948	334.2
7.4622	356.3	7.4952	350.8	7.5282	345.3	7.5612	339.8	7.5942	334.3
7.4616	356.4	7.4946	350.9	7.5276	345.4	7.5606	339.9	7.5936	334.4
7.461	356.5	7.494	351	7.527	345.5	7.56	340	7.593	334.5
7.4604	356.6	7.4934	351.1	7.5264	345.6	7.5594	340.1	7.5924	334.6
7.4598	356.7	7.4928	351.2	7.5258	345.7	7.5588	340.2	7.5918	334.7
7.4592	356.8	7.4922	351.3	7.5252	345.8	7.5582	340.3	7.5912	334.8
7.4586	356.9	7.4916	351.4	7.5246	345.9	7.5576	340.4	7.5906	334.9
7.458	357	7.491	351.5	7.524	346	7.557	340.5	7.59	335
7.4574	357.1	7.4904	351.6	7.5234	346.1	7.5564	340.6	7.5894	335.1
7.4568	357.2	7.4898	351.7	7.5228	346.2	7.5558	340.7	7.5888	335.2
7.4562	357.3	7.4892	351.8	7.5222	346.3	7.5552	340.8	7.5882	335.3
7.4556	357.4	7.4886	351.9	7.5216	346.4	7.5546	340.9	7.5876	335.4
7.455	357.5	7.488	352	7.521	346.5	7.554	341	7.587	335.5
7.4544	357.6	7.4874	352.1	7.5204	346.6	7.5534	341.1	7.5864	335.6
7.4538	357.7	7.4868	352.2	7.5198	346.7	7.5528	341.2	7.5858	335.7
7.4532	357.8	7.4862	352.3	7.5192	346.8	7.5522	341.3	7.5852	335.8
7.4526	357.9	7.4856	352.4	7.5186	346.9	7.5516	341.4	7.5846	335.9
7.452	358	7.485	352.5	7.518	347	7.551	341.5	7.584	336
7.4514	358.1	7.4844	352.6	7.5174	347.1	7.5504	341.6	7.5834	336.1
7.4508	358.2	7.4838	352.7	7.5168	347.2	7.5498	341.7	7.5828	336.2
7.4502	358.3	7.4832	352.8	7.5162	347.3	7.5492	341.8	7.5822	336.3
7.4496	358.4	7.4826	352.9	7.5156	347.4	7.5486	341.9	7.5816	336.4
7.449	358.5	7.482	353	7.515	347.5	7.548	342	7.581	336.5
7.4484	358.6	7.4814	353.1	7.5144	347.6	7.5474	342.1	7.5804	336.6
7.4478	358.7	7.4808	353.2	7.5138	347.7	7.5468	342.2	7.5798	336.7
7.4472	358.8	7.4802	353.3	7.5132	347.8	7.5462	342.3	7.5792	336.8
7.4466	358.9	7.4796	353.4	7.5126	347.9	7.5456	342.4	7.5786	336.9
7.446	359	7.479	353.5	7.512	348	7.545	342.5	7.578	337
7.4454	359.1	7.4784	353.6	7.5114	348.1	7.5444	342.6	7.5774	337.1
7.4448	359.2	7.4778	353.7	7.5108	348.2	7.5438	342.7	7.5768	337.2
7.4442	359.3	7.4772	353.8	7.5102	348.3	7.5432	342.8	7.5762	337.3
7.4436	359.4	7.4766	353.9	7.5096	348.4	7.5426	342.9	7.5756	337.4
7.443	359.5	7.476	354	7.509	348.5	7.542	343	7.575	337.5
7.4424	359.6	7.4754	354.1	7.5084	348.6	7.5414	343.1	7.5744	337.6
7.4418	359.7	7.4748	354.2	7.5078	348.7	7.5408	343.2	7.5738	337.7
7.4412	359.8	7.4742	354.3	7.5072	348.8	7.5402	343.3	7.5732	337.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
7.3086	381.9	7.3416	376.4	7.3746	370.9	7.4076	365.4	7.4406	359.9
7.308	382	7.341	376.5	7.374	371	7.407	365.5	7.44	360
7.3074	382.1	7.3404	376.6	7.3734	371.1	7.4064	365.6	7.4394	360.1
7.3068	382.2	7.3398	376.7	7.3728	371.2	7.4058	365.7	7.4388	360.2
7.3062	382.3	7.3392	376.8	7.3722	371.3	7.4052	365.8	7.4382	360.3
7.3056	382.4	7.3386	376.9	7.3716	371.4	7.4046	365.9	7.4376	360.4
7.305	382.5	7.338	377	7.371	371.5	7.404	366	7.437	360.5
7.3044	382.6	7.3374	377.1	7.3704	371.6	7.4034	366.1	7.4364	360.6
7.3038	382.7	7.3368	377.2	7.3698	371.7	7.4028	366.2	7.4358	360.7
7.3032	382.8	7.3362	377.3	7.3692	371.8	7.4022	366.3	7.4352	360.8
7.3026	382.9	7.3356	377.4	7.3686	371.9	7.4016	366.4	7.4346	360.9
7.302	383	7.335	377.5	7.368	372	7.401	366.5	7.434	361
7.3014	383.1	7.3344	377.6	7.3674	372.1	7.4004	366.6	7.4334	361.1
7.3008	383.2	7.3338	377.7	7.3668	372.2	7.3998	366.7	7.4328	361.2
7.3002	383.3	7.3332	377.8	7.3662	372.3	7.3992	366.8	7.4322	361.3
7.2996	383.4	7.3326	377.9	7.3656	372.4	7.3986	366.9	7.4316	361.4
7.299	383.5	7.332	378	7.365	372.5	7.398	367	7.431	361.5
7.2984	383.6	7.3314	378.1	7.3644	372.6	7.3974	367.1	7.4304	361.6
7.2978	383.7	7.3308	378.2	7.3638	372.7	7.3968	367.2	7.4298	361.7
7.2972	383.8	7.3302	378.3	7.3632	372.8	7.3962	367.3	7.4292	361.8
7.2966	383.9	7.3296	378.4	7.3626	372.9	7.3956	367.4	7.4286	361.9
7.296	384	7.329	378.5	7.362	373	7.395	367.5	7.428	362
7.2954	384.1	7.3284	378.6	7.3614	373.1	7.3944	367.6	7.4274	362.1
7.2948	384.2	7.3278	378.7	7.3608	373.2	7.3938	367.7	7.4268	362.2
7.2942	384.3	7.3272	378.8	7.3602	373.3	7.3932	367.8	7.4262	362.3
7.2936	384.4	7.3266	378.9	7.3596	373.4	7.3926	367.9	7.4256	362.4
7.293	384.5	7.326	379	7.359	373.5	7.392	368	7.425	362.5
7.2924	384.6	7.3254	379.1	7.3584	373.6	7.3914	368.1	7.4244	362.6
7.2918	384.7	7.3248	379.2	7.3578	373.7	7.3908	368.2	7.4238	362.7
7.2912	384.8	7.3242	379.3	7.3572	373.8	7.3902	368.3	7.4232	362.8
7.2906	384.9	7.3236	379.4	7.3566	373.9	7.3896	368.4	7.4226	362.9
7.29	385	7.323	379.5	7.356	374	7.389	368.5	7.422	363
7.2894	385.1	7.3224	379.6	7.3554	374.1	7.3884	368.6	7.4214	363.1
7.2888	385.2	7.3218	379.7	7.3548	374.2	7.3878	368.7	7.4208	363.2
7.2882	385.3	7.3212	379.8	7.3542	374.3	7.3872	368.8	7.4202	363.3
7.2876	385.4	7.3206	379.9	7.3536	374.4	7.3866	368.9	7.4196	363.4
7.287	385.5	7.32	380	7.353	374.5	7.386	369	7.419	363.5
7.2864	385.6	7.3194	380.1	7.3524	374.6	7.3854	369.1	7.4184	363.6
7.2858	385.7	7.3188	380.2	7.3518	374.7	7.3848	369.2	7.4178	363.7
7.2852	385.8	7.3182	380.3	7.3512	374.8	7.3842	369.3	7.4172	363.8
7.2846	385.9	7.3176	380.4	7.3506	374.9	7.3836	369.4	7.4166	363.9
7.284	386	7.317	380.5	7.35	375	7.383	369.5	7.416	364
7.2834	386.1	7.3164	380.6	7.3494	375.1	7.3824	369.6	7.4154	364.1
7.2828	386.2	7.3158	380.7	7.3488	375.2	7.3818	369.7	7.4148	364.2
7.2822	386.3	7.3152	380.8	7.3482	375.3	7.3812	369.8	7.4142	364.3
7.2816	386.4	7.3146	380.9	7.3476	375.4	7.3806	369.9	7.4136	364.4
7.281	386.5	7.314	381	7.347	375.5	7.38	370	7.413	364.5
7.2804	386.6	7.3134	381.1	7.3464	375.6	7.3794	370.1	7.4124	364.6
7.2798	386.7	7.3128	381.2	7.3458	375.7	7.3788	370.2	7.4118	364.7
7.2792	386.8	7.3122	381.3	7.3452	375.8	7.3782	370.3	7.4112	364.8
7.2786	386.9	7.3116	381.4	7.3446	375.9	7.3776	370.4	7.4106	364.9
7.278	387	7.311	381.5	7.344	376	7.377	370.5	7.41	365
7.2774	387.1	7.3104	381.6	7.3434	376.1	7.3764	370.6	7.4094	365.1
7.2768	387.2	7.3098	381.7	7.3428	376.2	7.3758	370.7	7.4088	365.2
7.2762	387.3	7.3092	381.8	7.3422	376.3	7.3752	370.8	7.4082	365.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
7.1436	409.4	7.1766	403.9	7.2096	398.4	7.2426	392.9	7.2756	387.4
7.143	409.5	7.176	404	7.209	398.5	7.242	393	7.275	387.5
7.1424	409.6	7.1754	404.1	7.2084	398.6	7.2414	393.1	7.2744	387.6
7.1418	409.7	7.1748	404.2	7.2078	398.7	7.2408	393.2	7.2738	387.7
7.1412	409.8	7.1742	404.3	7.2072	398.8	7.2402	393.3	7.2732	387.8
7.1406	409.9	7.1736	404.4	7.2066	398.9	7.2396	393.4	7.2726	387.9
7.14	410	7.173	404.5	7.206	399	7.239	393.5	7.272	388
7.1394	410.1	7.1724	404.6	7.2054	399.1	7.2384	393.6	7.2714	388.1
7.1388	410.2	7.1718	404.7	7.2048	399.2	7.2378	393.7	7.2708	388.2
7.1382	410.3	7.1712	404.8	7.2042	399.3	7.2372	393.8	7.2702	388.3
7.1376	410.4	7.1706	404.9	7.2036	399.4	7.2366	393.9	7.2696	388.4
7.137	410.5	7.17	405	7.203	399.5	7.236	394	7.269	388.5
7.1364	410.6	7.1694	405.1	7.2024	399.6	7.2354	394.1	7.2684	388.6
7.1358	410.7	7.1688	405.2	7.2018	399.7	7.2348	394.2	7.2678	388.7
7.1352	410.8	7.1682	405.3	7.2012	399.8	7.2342	394.3	7.2672	388.8
7.1346	410.9	7.1676	405.4	7.2006	399.9	7.2336	394.4	7.2666	388.9
7.134	411	7.167	405.5	7.2	400	7.233	394.5	7.266	389
7.1334	411.1	7.1664	405.6	7.1994	400.1	7.2324	394.6	7.2654	389.1
7.1328	411.2	7.1658	405.7	7.1988	400.2	7.2318	394.7	7.2648	389.2
7.1322	411.3	7.1652	405.8	7.1982	400.3	7.2312	394.8	7.2642	389.3
7.1316	411.4	7.1646	405.9	7.1976	400.4	7.2306	394.9	7.2636	389.4
7.131	411.5	7.164	406	7.197	400.5	7.23	395	7.263	389.5
7.1304	411.6	7.1634	406.1	7.1964	400.6	7.2294	395.1	7.2624	389.6
7.1298	411.7	7.1628	406.2	7.1958	400.7	7.2288	395.2	7.2618	389.7
7.1292	411.8	7.1622	406.3	7.1952	400.8	7.2282	395.3	7.2612	389.8
7.1286	411.9	7.1616	406.4	7.1946	400.9	7.2276	395.4	7.2606	389.9
7.128	412	7.161	406.5	7.194	401	7.227	395.5	7.26	390
7.1274	412.1	7.1604	406.6	7.1934	401.1	7.2264	395.6	7.2594	390.1
7.1268	412.2	7.1598	406.7	7.1928	401.2	7.2258	395.7	7.2588	390.2
7.1262	412.3	7.1592	406.8	7.1922	401.3	7.2252	395.8	7.2582	390.3
7.1256	412.4	7.1586	406.9	7.1916	401.4	7.2246	395.9	7.2576	390.4
7.125	412.5	7.158	407	7.191	401.5	7.224	396	7.257	390.5
7.1244	412.6	7.1574	407.1	7.1904	401.6	7.2234	396.1	7.2564	390.6
7.1238	412.7	7.1568	407.2	7.1898	401.7	7.2228	396.2	7.2558	390.7
7.1232	412.8	7.1562	407.3	7.1892	401.8	7.2222	396.3	7.2552	390.8
7.1226	412.9	7.1556	407.4	7.1886	401.9	7.2216	396.4	7.2546	390.9
7.122	413	7.155	407.5	7.188	402	7.221	396.5	7.254	391
7.1214	413.1	7.1544	407.6	7.1874	402.1	7.2204	396.6	7.2534	391.1
7.1208	413.2	7.1538	407.7	7.1868	402.2	7.2198	396.7	7.2528	391.2
7.1202	413.3	7.1532	407.8	7.1862	402.3	7.2192	396.8	7.2522	391.3
7.1196	413.4	7.1526	407.9	7.1856	402.4	7.2186	396.9	7.2516	391.4
7.119	413.5	7.152	408	7.185	402.5	7.218	397	7.251	391.5
7.1184	413.6	7.1514	408.1	7.1844	402.6	7.2174	397.1	7.2504	391.6
7.1178	413.7	7.1508	408.2	7.1838	402.7	7.2168	397.2	7.2498	391.7
7.1172	413.8	7.1502	408.3	7.1832	402.8	7.2162	397.3	7.2492	391.8
7.1166	413.9	7.1496	408.4	7.1826	402.9	7.2156	397.4	7.2486	391.9
7.116	414	7.149	408.5	7.182	403	7.215	397.5	7.248	392
7.1154	414.1	7.1484	408.6	7.1814	403.1	7.2144	397.6	7.2474	392.1
7.1148	414.2	7.1478	408.7	7.1808	403.2	7.2138	397.7	7.2468	392.2
7.1142	414.3	7.1472	408.8	7.1802	403.3	7.2132	397.8	7.2462	392.3
7.1136	414.4	7.1466	408.9	7.1796	403.4	7.2126	397.9	7.2456	392.4
7.113	414.5	7.146	409	7.179	403.5	7.212	398	7.245	392.5
7.1124	414.6	7.1454	409.1	7.1784	403.6	7.2114	398.1	7.2444	392.6
7.1118	414.7	7.1448	409.2	7.1778	403.7	7.2108	398.2	7.2438	392.7
7.1112	414.8	7.1442	409.3	7.1772	403.8	7.2102	398.3	7.2432	392.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.9786	436.9	7.0116	431.4	7.0446	425.9	7.0776	420.4	7.1106	414.9
6.978	437	7.011	431.5	7.044	426	7.077	420.5	7.11	415
6.9774	437.1	7.0104	431.6	7.0434	426.1	7.0764	420.6	7.1094	415.1
6.9768	437.2	7.0098	431.7	7.0428	426.2	7.0758	420.7	7.1088	415.2
6.9762	437.3	7.0092	431.8	7.0422	426.3	7.0752	420.8	7.1082	415.3
6.9756	437.4	7.0086	431.9	7.0416	426.4	7.0746	420.9	7.1076	415.4
6.975	437.5	7.008	432	7.041	426.5	7.074	421	7.107	415.5
6.9744	437.6	7.0074	432.1	7.0404	426.6	7.0734	421.1	7.1064	415.6
6.9738	437.7	7.0068	432.2	7.0398	426.7	7.0728	421.2	7.1058	415.7
6.9732	437.8	7.0062	432.3	7.0392	426.8	7.0722	421.3	7.1052	415.8
6.9726	437.9	7.0056	432.4	7.0386	426.9	7.0716	421.4	7.1046	415.9
6.972	438	7.005	432.5	7.038	427	7.071	421.5	7.104	416
6.9714	438.1	7.0044	432.6	7.0374	427.1	7.0704	421.6	7.1034	416.1
6.9708	438.2	7.0038	432.7	7.0368	427.2	7.0698	421.7	7.1028	416.2
6.9702	438.3	7.0032	432.8	7.0362	427.3	7.0692	421.8	7.1022	416.3
6.9696	438.4	7.0026	432.9	7.0356	427.4	7.0686	421.9	7.1016	416.4
6.969	438.5	7.002	433	7.035	427.5	7.068	422	7.101	416.5
6.9684	438.6	7.0014	433.1	7.0344	427.6	7.0674	422.1	7.1004	416.6
6.9678	438.7	7.0008	433.2	7.0338	427.7	7.0668	422.2	7.0998	416.7
6.9672	438.8	7.0002	433.3	7.0332	427.8	7.0662	422.3	7.0992	416.8
6.9666	438.9	6.9996	433.4	7.0326	427.9	7.0656	422.4	7.0986	416.9
6.966	439	6.999	433.5	7.032	428	7.065	422.5	7.098	417
6.9654	439.1	6.9984	433.6	7.0314	428.1	7.0644	422.6	7.0974	417.1
6.9648	439.2	6.9978	433.7	7.0308	428.2	7.0638	422.7	7.0968	417.2
6.9642	439.3	6.9972	433.8	7.0302	428.3	7.0632	422.8	7.0962	417.3
6.9636	439.4	6.9966	433.9	7.0296	428.4	7.0626	422.9	7.0956	417.4
6.963	439.5	6.996	434	7.029	428.5	7.062	423	7.095	417.5
6.9624	439.6	6.9954	434.1	7.0284	428.6	7.0614	423.1	7.0944	417.6
6.9618	439.7	6.9948	434.2	7.0278	428.7	7.0608	423.2	7.0938	417.7
6.9612	439.8	6.9942	434.3	7.0272	428.8	7.0602	423.3	7.0932	417.8
6.9606	439.9	6.9936	434.4	7.0266	428.9	7.0596	423.4	7.0926	417.9
6.96	440	6.993	434.5	7.026	429	7.059	423.5	7.092	418
6.9594	440.1	6.9924	434.6	7.0254	429.1	7.0584	423.6	7.0914	418.1
6.9588	440.2	6.9918	434.7	7.0248	429.2	7.0578	423.7	7.0908	418.2
6.9582	440.3	6.9912	434.8	7.0242	429.3	7.0572	423.8	7.0902	418.3
6.9576	440.4	6.9906	434.9	7.0236	429.4	7.0566	423.9	7.0896	418.4
6.957	440.5	6.99	435	7.023	429.5	7.056	424	7.089	418.5
6.9564	440.6	6.9894	435.1	7.0224	429.6	7.0554	424.1	7.0884	418.6
6.9558	440.7	6.9888	435.2	7.0218	429.7	7.0548	424.2	7.0878	418.7
6.9552	440.8	6.9882	435.3	7.0212	429.8	7.0542	424.3	7.0872	418.8
6.9546	440.9	6.9876	435.4	7.0206	429.9	7.0536	424.4	7.0866	418.9
6.954	441	6.987	435.5	7.02	430	7.053	424.5	7.086	419
6.9534	441.1	6.9864	435.6	7.0194	430.1	7.0524	424.6	7.0854	419.1
6.9528	441.2	6.9858	435.7	7.0188	430.2	7.0518	424.7	7.0848	419.2
6.9522	441.3	6.9852	435.8	7.0182	430.3	7.0512	424.8	7.0842	419.3
6.9516	441.4	6.9846	435.9	7.0176	430.4	7.0506	424.9	7.0836	419.4
6.951	441.5	6.984	436	7.017	430.5	7.05	425	7.083	419.5
6.9504	441.6	6.9834	436.1	7.0164	430.6	7.0494	425.1	7.0824	419.6
6.9498	441.7	6.9828	436.2	7.0158	430.7	7.0488	425.2	7.0818	419.7
6.9492	441.8	6.9822	436.3	7.0152	430.8	7.0482	425.3	7.0812	419.8
6.9486	441.9	6.9816	436.4	7.0146	430.9	7.0476	425.4	7.0806	419.9
6.948	442	6.981	436.5	7.014	431	7.047	425.5	7.08	420
6.9474	442.1	6.9804	436.6	7.0134	431.1	7.0464	425.6	7.0794	420.1
6.9468	442.2	6.9798	436.7	7.0128	431.2	7.0458	425.7	7.0788	420.2
6.9462	442.3	6.9792	436.8	7.0122	431.3	7.0452	425.8	7.0782	420.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.8136	464.4	6.8466	458.9	6.8796	453.4	6.9126	447.9	6.9456	442.4
6.813	464.5	6.846	459	6.879	453.5	6.912	448	6.945	442.5
6.8124	464.6	6.8454	459.1	6.8784	453.6	6.9114	448.1	6.9444	442.6
6.8118	464.7	6.8448	459.2	6.8778	453.7	6.9108	448.2	6.9438	442.7
6.8112	464.8	6.8442	459.3	6.8772	453.8	6.9102	448.3	6.9432	442.8
6.8106	464.9	6.8436	459.4	6.8766	453.9	6.9096	448.4	6.9426	442.9
6.81	465	6.843	459.5	6.876	454	6.909	448.5	6.942	443
6.8094	465.1	6.8424	459.6	6.8754	454.1	6.9084	448.6	6.9414	443.1
6.8088	465.2	6.8418	459.7	6.8748	454.2	6.9078	448.7	6.9408	443.2
6.8082	465.3	6.8412	459.8	6.8742	454.3	6.9072	448.8	6.9402	443.3
6.8076	465.4	6.8406	459.9	6.8736	454.4	6.9066	448.9	6.9396	443.4
6.807	465.5	6.84	460	6.873	454.5	6.906	449	6.939	443.5
6.8064	465.6	6.8394	460.1	6.8724	454.6	6.9054	449.1	6.9384	443.6
6.8058	465.7	6.8388	460.2	6.8718	454.7	6.9048	449.2	6.9378	443.7
6.8052	465.8	6.8382	460.3	6.8712	454.8	6.9042	449.3	6.9372	443.8
6.8046	465.9	6.8376	460.4	6.8706	454.9	6.9036	449.4	6.9366	443.9
6.804	466	6.837	460.5	6.87	455	6.903	449.5	6.936	444
6.8034	466.1	6.8364	460.6	6.8694	455.1	6.9024	449.6	6.9354	444.1
6.8028	466.2	6.8358	460.7	6.8688	455.2	6.9018	449.7	6.9348	444.2
6.8022	466.3	6.8352	460.8	6.8682	455.3	6.9012	449.8	6.9342	444.3
6.8016	466.4	6.8346	460.9	6.8676	455.4	6.9006	449.9	6.9336	444.4
6.801	466.5	6.834	461	6.867	455.5	6.9	450	6.933	444.5
6.8004	466.6	6.8334	461.1	6.8664	455.6	6.8994	450.1	6.9324	444.6
6.7998	466.7	6.8328	461.2	6.8658	455.7	6.8988	450.2	6.9318	444.7
6.7992	466.8	6.8322	461.3	6.8652	455.8	6.8982	450.3	6.9312	444.8
6.7986	466.9	6.8316	461.4	6.8646	455.9	6.8976	450.4	6.9306	444.9
6.798	467	6.831	461.5	6.864	456	6.897	450.5	6.93	445
6.7974	467.1	6.8304	461.6	6.8634	456.1	6.8964	450.6	6.9294	445.1
6.7968	467.2	6.8298	461.7	6.8628	456.2	6.8958	450.7	6.9288	445.2
6.7962	467.3	6.8292	461.8	6.8622	456.3	6.8952	450.8	6.9282	445.3
6.7956	467.4	6.8286	461.9	6.8616	456.4	6.8946	450.9	6.9276	445.4
6.795	467.5	6.828	462	6.861	456.5	6.894	451	6.927	445.5
6.7944	467.6	6.8274	462.1	6.8604	456.6	6.8934	451.1	6.9264	445.6
6.7938	467.7	6.8268	462.2	6.8598	456.7	6.8928	451.2	6.9258	445.7
6.7932	467.8	6.8262	462.3	6.8592	456.8	6.8922	451.3	6.9252	445.8
6.7926	467.9	6.8256	462.4	6.8586	456.9	6.8916	451.4	6.9246	445.9
6.792	468	6.825	462.5	6.858	457	6.891	451.5	6.924	446
6.7914	468.1	6.8244	462.6	6.8574	457.1	6.8904	451.6	6.9234	446.1
6.7908	468.2	6.8238	462.7	6.8568	457.2	6.8898	451.7	6.9228	446.2
6.7902	468.3	6.8232	462.8	6.8562	457.3	6.8892	451.8	6.9222	446.3
6.7896	468.4	6.8226	462.9	6.8556	457.4	6.8886	451.9	6.9216	446.4
6.789	468.5	6.822	463	6.855	457.5	6.888	452	6.921	446.5
6.7884	468.6	6.8214	463.1	6.8544	457.6	6.8874	452.1	6.9204	446.6
6.7878	468.7	6.8208	463.2	6.8538	457.7	6.8868	452.2	6.9198	446.7
6.7872	468.8	6.8202	463.3	6.8532	457.8	6.8862	452.3	6.9192	446.8
6.7866	468.9	6.8196	463.4	6.8526	457.9	6.8856	452.4	6.9186	446.9
6.786	469	6.819	463.5	6.852	458	6.885	452.5	6.918	447
6.7854	469.1	6.8184	463.6	6.8514	458.1	6.8844	452.6	6.9174	447.1
6.7848	469.2	6.8178	463.7	6.8508	458.2	6.8838	452.7	6.9168	447.2
6.7842	469.3	6.8172	463.8	6.8502	458.3	6.8832	452.8	6.9162	447.3
6.7836	469.4	6.8166	463.9	6.8496	458.4	6.8826	452.9	6.9156	447.4
6.783	469.5	6.816	464	6.849	458.5	6.882	453	6.915	447.5
6.7824	469.6	6.8154	464.1	6.8484	458.6	6.8814	453.1	6.9144	447.6
6.7818	469.7	6.8148	464.2	6.8478	458.7	6.8808	453.2	6.9138	447.7
6.7812	469.8	6.8142	464.3	6.8472	458.8	6.8802	453.3	6.9132	447.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.6486	491.9	6.6816	486.4	6.7146	480.9	6.7476	475.4	6.7806	469.9
6.648	492	6.681	486.5	6.714	481	6.747	475.5	6.78	470
6.6474	492.1	6.6804	486.6	6.7134	481.1	6.7464	475.6	6.7794	470.1
6.6468	492.2	6.6798	486.7	6.7128	481.2	6.7458	475.7	6.7788	470.2
6.6462	492.3	6.6792	486.8	6.7122	481.3	6.7452	475.8	6.7782	470.3
6.6456	492.4	6.6786	486.9	6.7116	481.4	6.7446	475.9	6.7776	470.4
6.645	492.5	6.678	487	6.711	481.5	6.744	476	6.777	470.5
6.6444	492.6	6.6774	487.1	6.7104	481.6	6.7434	476.1	6.7764	470.6
6.6438	492.7	6.6768	487.2	6.7098	481.7	6.7428	476.2	6.7758	470.7
6.6432	492.8	6.6762	487.3	6.7092	481.8	6.7422	476.3	6.7752	470.8
6.6426	492.9	6.6756	487.4	6.7086	481.9	6.7416	476.4	6.7746	470.9
6.642	493	6.675	487.5	6.708	482	6.741	476.5	6.774	471
6.6414	493.1	6.6744	487.6	6.7074	482.1	6.7404	476.6	6.7734	471.1
6.6408	493.2	6.6738	487.7	6.7068	482.2	6.7398	476.7	6.7728	471.2
6.6402	493.3	6.6732	487.8	6.7062	482.3	6.7392	476.8	6.7722	471.3
6.6396	493.4	6.6726	487.9	6.7056	482.4	6.7386	476.9	6.7716	471.4
6.639	493.5	6.672	488	6.705	482.5	6.738	477	6.771	471.5
6.6384	493.6	6.6714	488.1	6.7044	482.6	6.7374	477.1	6.7704	471.6
6.6378	493.7	6.6708	488.2	6.7038	482.7	6.7368	477.2	6.7698	471.7
6.6372	493.8	6.6702	488.3	6.7032	482.8	6.7362	477.3	6.7692	471.8
6.6366	493.9	6.6696	488.4	6.7026	482.9	6.7356	477.4	6.7686	471.9
6.636	494	6.669	488.5	6.702	483	6.735	477.5	6.768	472
6.6354	494.1	6.6684	488.6	6.7014	483.1	6.7344	477.6	6.7674	472.1
6.6348	494.2	6.6678	488.7	6.7008	483.2	6.7338	477.7	6.7668	472.2
6.6342	494.3	6.6672	488.8	6.7002	483.3	6.7332	477.8	6.7662	472.3
6.6336	494.4	6.6666	488.9	6.6996	483.4	6.7326	477.9	6.7656	472.4
6.633	494.5	6.666	489	6.699	483.5	6.732	478	6.765	472.5
6.6324	494.6	6.6654	489.1	6.6984	483.6	6.7314	478.1	6.7644	472.6
6.6318	494.7	6.6648	489.2	6.6978	483.7	6.7308	478.2	6.7638	472.7
6.6312	494.8	6.6642	489.3	6.6972	483.8	6.7302	478.3	6.7632	472.8
6.6306	494.9	6.6636	489.4	6.6966	483.9	6.7296	478.4	6.7626	472.9
6.63	495	6.663	489.5	6.696	484	6.729	478.5	6.762	473
6.6294	495.1	6.6624	489.6	6.6954	484.1	6.7284	478.6	6.7614	473.1
6.6288	495.2	6.6618	489.7	6.6948	484.2	6.7278	478.7	6.7608	473.2
6.6282	495.3	6.6612	489.8	6.6942	484.3	6.7272	478.8	6.7602	473.3
6.6276	495.4	6.6606	489.9	6.6936	484.4	6.7266	478.9	6.7596	473.4
6.627	495.5	6.66	490	6.693	484.5	6.726	479	6.759	473.5
6.6264	495.6	6.6594	490.1	6.6924	484.6	6.7254	479.1	6.7584	473.6
6.6258	495.7	6.6588	490.2	6.6918	484.7	6.7248	479.2	6.7578	473.7
6.6252	495.8	6.6582	490.3	6.6912	484.8	6.7242	479.3	6.7572	473.8
6.6246	495.9	6.6576	490.4	6.6906	484.9	6.7236	479.4	6.7566	473.9
6.624	496	6.657	490.5	6.69	485	6.723	479.5	6.756	474
6.6234	496.1	6.6564	490.6	6.6894	485.1	6.7224	479.6	6.7554	474.1
6.6228	496.2	6.6558	490.7	6.6888	485.2	6.7218	479.7	6.7548	474.2
6.6222	496.3	6.6552	490.8	6.6882	485.3	6.7212	479.8	6.7542	474.3
6.6216	496.4	6.6546	490.9	6.6876	485.4	6.7206	479.9	6.7536	474.4
6.621	496.5	6.654	491	6.687	485.5	6.72	480	6.753	474.5
6.6204	496.6	6.6534	491.1	6.6864	485.6	6.7194	480.1	6.7524	474.6
6.6198	496.7	6.6528	491.2	6.6858	485.7	6.7188	480.2	6.7518	474.7
6.6192	496.8	6.6522	491.3	6.6852	485.8	6.7182	480.3	6.7512	474.8
6.6186	496.9	6.6516	491.4	6.6846	485.9	6.7176	480.4	6.7506	474.9
6.618	497	6.651	491.5	6.684	486	6.717	480.5	6.75	475
6.6174	497.1	6.6504	491.6	6.6834	486.1	6.7164	480.6	6.7494	475.1
6.6168	497.2	6.6498	491.7	6.6828	486.2	6.7158	480.7	6.7488	475.2
6.6162	497.3	6.6492	491.8	6.6822	486.3	6.7152	480.8	6.7482	475.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.5321	519.4	6.55135	513.9	6.5706	508.4	6.58985	502.9	6.6156	497.4
6.53175	519.5	6.551	514	6.57025	508.5	6.5895	503	6.615	497.5
6.5314	519.6	6.55065	514.1	6.5699	508.6	6.58915	503.1	6.6144	497.6
6.53105	519.7	6.5503	514.2	6.56955	508.7	6.5888	503.2	6.6138	497.7
6.5307	519.8	6.54995	514.3	6.5692	508.8	6.58845	503.3	6.6132	497.8
6.53035	519.9	6.5496	514.4	6.56885	508.9	6.5881	503.4	6.6126	497.9
6.53	520	6.54925	514.5	6.5685	509	6.58775	503.5	6.612	498
6.52965	520.1	6.5489	514.6	6.56815	509.1	6.5874	503.6	6.6114	498.1
6.5293	520.2	6.54855	514.7	6.5678	509.2	6.58705	503.7	6.6108	498.2
6.52895	520.3	6.5482	514.8	6.56745	509.3	6.5867	503.8	6.6102	498.3
6.5286	520.4	6.54785	514.9	6.5671	509.4	6.58635	503.9	6.6096	498.4
6.52825	520.5	6.5475	515	6.56675	509.5	6.586	504	6.609	498.5
6.5279	520.6	6.54715	515.1	6.5664	509.6	6.58565	504.1	6.6084	498.6
6.52755	520.7	6.5468	515.2	6.56605	509.7	6.5853	504.2	6.6078	498.7
6.5272	520.8	6.54645	515.3	6.5657	509.8	6.58495	504.3	6.6072	498.8
6.52685	520.9	6.5461	515.4	6.56535	509.9	6.5846	504.4	6.6066	498.9
6.5265	521	6.54575	515.5	6.565	510	6.58425	504.5	6.606	499
6.52615	521.1	6.5454	515.6	6.56465	510.1	6.5839	504.6	6.6054	499.1
6.5258	521.2	6.54505	515.7	6.5643	510.2	6.58355	504.7	6.6048	499.2
6.52545	521.3	6.5447	515.8	6.56395	510.3	6.5832	504.8	6.6042	499.3
6.5251	521.4	6.54435	515.9	6.5636	510.4	6.58285	504.9	6.6036	499.4
6.52475	521.5	6.544	516	6.56325	510.5	6.5825	505	6.603	499.5
6.5244	521.6	6.54365	516.1	6.5629	510.6	6.58215	505.1	6.6024	499.6
6.52405	521.7	6.5433	516.2	6.56255	510.7	6.5818	505.2	6.6018	499.7
6.5237	521.8	6.54295	516.3	6.5622	510.8	6.58145	505.3	6.6012	499.8
6.52335	521.9	6.5426	516.4	6.56185	510.9	6.5811	505.4	6.6006	499.9
6.523	522	6.54225	516.5	6.5615	511	6.58075	505.5	6.6	500
6.52265	522.1	6.5419	516.6	6.56115	511.1	6.5804	505.6	6.59965	500.1
6.5223	522.2	6.54155	516.7	6.5608	511.2	6.58005	505.7	6.5993	500.2
6.52195	522.3	6.5412	516.8	6.56045	511.3	6.5797	505.8	6.59895	500.3
6.5216	522.4	6.54085	516.9	6.5601	511.4	6.57935	505.9	6.5986	500.4
6.52125	522.5	6.5405	517	6.55975	511.5	6.579	506	6.59825	500.5
6.5209	522.6	6.54015	517.1	6.5594	511.6	6.57865	506.1	6.5979	500.6
6.52055	522.7	6.5398	517.2	6.55905	511.7	6.5783	506.2	6.59755	500.7
6.5202	522.8	6.53945	517.3	6.5587	511.8	6.57795	506.3	6.5972	500.8
6.51985	522.9	6.5391	517.4	6.55835	511.9	6.5776	506.4	6.59685	500.9
6.5195	523	6.53875	517.5	6.558	512	6.57725	506.5	6.5965	501
6.51915	523.1	6.5384	517.6	6.55765	512.1	6.5769	506.6	6.59615	501.1
6.5188	523.2	6.53805	517.7	6.5573	512.2	6.57655	506.7	6.5958	501.2
6.51845	523.3	6.5377	517.8	6.55695	512.3	6.5762	506.8	6.59545	501.3
6.5181	523.4	6.53735	517.9	6.5566	512.4	6.57585	506.9	6.5951	501.4
6.51775	523.5	6.537	518	6.55625	512.5	6.5755	507	6.59475	501.5
6.5174	523.6	6.53665	518.1	6.5559	512.6	6.57515	507.1	6.5944	501.6
6.51705	523.7	6.5363	518.2	6.55555	512.7	6.5748	507.2	6.59405	501.7
6.5167	523.8	6.53595	518.3	6.5552	512.8	6.57445	507.3	6.5937	501.8
6.51635	523.9	6.5356	518.4	6.55485	512.9	6.5741	507.4	6.59335	501.9
6.516	524	6.53525	518.5	6.5545	513	6.57375	507.5	6.593	502
6.51565	524.1	6.5349	518.6	6.55415	513.1	6.5734	507.6	6.59265	502.1
6.5153	524.2	6.53455	518.7	6.5538	513.2	6.57305	507.7	6.5923	502.2
6.51495	524.3	6.5342	518.8	6.55345	513.3	6.5727	507.8	6.59195	502.3
6.5146	524.4	6.53385	518.9	6.5531	513.4	6.57235	507.9	6.5916	502.4
6.51425	524.5	6.5335	519	6.55275	513.5	6.572	508	6.59125	502.5
6.5139	524.6	6.53315	519.1	6.5524	513.6	6.57165	508.1	6.5909	502.6
6.51355	524.7	6.5328	519.2	6.55205	513.7	6.5713	508.2	6.59055	502.7
6.5132	524.8	6.53245	519.3	6.5517	513.8	6.57095	508.3	6.5902	502.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.43585	546.9	6.4551	541.4	6.47435	535.9	6.4936	530.4	6.51285	524.9
6.4355	547	6.45475	541.5	6.474	536	6.49325	530.5	6.5125	525
6.43515	547.1	6.4544	541.6	6.47365	536.1	6.4929	530.6	6.51215	525.1
6.4348	547.2	6.45405	541.7	6.4733	536.2	6.49255	530.7	6.5118	525.2
6.43445	547.3	6.4537	541.8	6.47295	536.3	6.4922	530.8	6.51145	525.3
6.4341	547.4	6.45335	541.9	6.4726	536.4	6.49185	530.9	6.5111	525.4
6.43375	547.5	6.453	542	6.47225	536.5	6.4915	531	6.51075	525.5
6.4334	547.6	6.45265	542.1	6.4719	536.6	6.49115	531.1	6.5104	525.6
6.43305	547.7	6.4523	542.2	6.47155	536.7	6.4908	531.2	6.51005	525.7
6.4327	547.8	6.45195	542.3	6.4712	536.8	6.49045	531.3	6.5097	525.8
6.43235	547.9	6.4516	542.4	6.47085	536.9	6.4901	531.4	6.50935	525.9
6.432	548	6.45125	542.5	6.4705	537	6.48975	531.5	6.509	526
6.43165	548.1	6.4509	542.6	6.47015	537.1	6.4894	531.6	6.50865	526.1
6.4313	548.2	6.45055	542.7	6.4698	537.2	6.48905	531.7	6.5083	526.2
6.43095	548.3	6.4502	542.8	6.46945	537.3	6.4887	531.8	6.50795	526.3
6.4306	548.4	6.44985	542.9	6.4691	537.4	6.48835	531.9	6.5076	526.4
6.43025	548.5	6.4495	543	6.46875	537.5	6.488	532	6.50725	526.5
6.4299	548.6	6.44915	543.1	6.4684	537.6	6.48765	532.1	6.5069	526.6
6.42955	548.7	6.4488	543.2	6.46805	537.7	6.4873	532.2	6.50655	526.7
6.4292	548.8	6.44845	543.3	6.4677	537.8	6.48695	532.3	6.5062	526.8
6.42885	548.9	6.4481	543.4	6.46735	537.9	6.4866	532.4	6.50585	526.9
6.4285	549	6.44775	543.5	6.467	538	6.48625	532.5	6.5055	527
6.42815	549.1	6.4474	543.6	6.46665	538.1	6.4859	532.6	6.50515	527.1
6.4278	549.2	6.44705	543.7	6.4663	538.2	6.48555	532.7	6.5048	527.2
6.42745	549.3	6.4467	543.8	6.46595	538.3	6.4852	532.8	6.50445	527.3
6.4271	549.4	6.44635	543.9	6.4656	538.4	6.48485	532.9	6.5041	527.4
6.42675	549.5	6.446	544	6.46525	538.5	6.4845	533	6.50375	527.5
6.4264	549.6	6.44565	544.1	6.4649	538.6	6.48415	533.1	6.5034	527.6
6.42605	549.7	6.4453	544.2	6.46455	538.7	6.4838	533.2	6.50305	527.7
6.4257	549.8	6.44495	544.3	6.4642	538.8	6.48345	533.3	6.5027	527.8
6.42535	549.9	6.4446	544.4	6.46385	538.9	6.4831	533.4	6.50235	527.9
6.425	550	6.44425	544.5	6.4635	539	6.48275	533.5	6.502	528
6.42465	550.1	6.4439	544.6	6.46315	539.1	6.4824	533.6	6.50165	528.1
6.4243	550.2	6.44355	544.7	6.4628	539.2	6.48205	533.7	6.5013	528.2
6.42395	550.3	6.4432	544.8	6.46245	539.3	6.4817	533.8	6.50095	528.3
6.4236	550.4	6.44285	544.9	6.4621	539.4	6.48135	533.9	6.5006	528.4
6.42325	550.5	6.4425	545	6.46175	539.5	6.481	534	6.50025	528.5
6.4229	550.6	6.44215	545.1	6.4614	539.6	6.48065	534.1	6.4999	528.6
6.42255	550.7	6.4418	545.2	6.46105	539.7	6.4803	534.2	6.49955	528.7
6.4222	550.8	6.44145	545.3	6.4607	539.8	6.47995	534.3	6.4992	528.8
6.42185	550.9	6.4411	545.4	6.46035	539.9	6.4796	534.4	6.49885	528.9
6.4215	551	6.44075	545.5	6.46	540	6.47925	534.5	6.4985	529
6.42115	551.1	6.4404	545.6	6.45965	540.1	6.4789	534.6	6.49815	529.1
6.4208	551.2	6.44005	545.7	6.4593	540.2	6.47855	534.7	6.4978	529.2
6.42045	551.3	6.4397	545.8	6.45895	540.3	6.4782	534.8	6.49745	529.3
6.4201	551.4	6.43935	545.9	6.4586	540.4	6.47785	534.9	6.4971	529.4
6.41975	551.5	6.439	546	6.45825	540.5	6.4775	535	6.49675	529.5
6.4194	551.6	6.43865	546.1	6.4579	540.6	6.47715	535.1	6.4964	529.6
6.41905	551.7	6.4383	546.2	6.45755	540.7	6.4768	535.2	6.49605	529.7
6.4187	551.8	6.43795	546.3	6.4572	540.8	6.47645	535.3	6.4957	529.8
6.41835	551.9	6.4376	546.4	6.45685	540.9	6.4761	535.4	6.49535	529.9
6.418	552	6.43725	546.5	6.4565	541	6.47575	535.5	6.495	530
6.41765	552.1	6.4369	546.6	6.45615	541.1	6.4754	535.6	6.49465	530.1
6.4173	552.2	6.43655	546.7	6.4558	541.2	6.47505	535.7	6.4943	530.2
6.41695	552.3	6.4362	546.8	6.45545	541.3	6.4747	535.8	6.49395	530.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.3396	574.4	6.35885	568.9	6.3781	563.4	6.39735	557.9	6.4166	552.4
6.33925	574.5	6.3585	569	6.37775	563.5	6.397	558	6.41625	552.5
6.3389	574.6	6.35815	569.1	6.3774	563.6	6.39665	558.1	6.4159	552.6
6.33855	574.7	6.3578	569.2	6.37705	563.7	6.3963	558.2	6.41555	552.7
6.3382	574.8	6.35745	569.3	6.3767	563.8	6.39595	558.3	6.4152	552.8
6.33785	574.9	6.3571	569.4	6.37635	563.9	6.3956	558.4	6.41485	552.9
6.3375	575	6.35675	569.5	6.376	564	6.39525	558.5	6.4145	553
6.33715	575.1	6.3564	569.6	6.37565	564.1	6.3949	558.6	6.41415	553.1
6.3368	575.2	6.35605	569.7	6.3753	564.2	6.39455	558.7	6.4138	553.2
6.33645	575.3	6.3557	569.8	6.37495	564.3	6.3942	558.8	6.41345	553.3
6.3361	575.4	6.35535	569.9	6.3746	564.4	6.39385	558.9	6.4131	553.4
6.33575	575.5	6.355	570	6.37425	564.5	6.3935	559	6.41275	553.5
6.3354	575.6	6.35465	570.1	6.3739	564.6	6.39315	559.1	6.4124	553.6
6.33505	575.7	6.3543	570.2	6.37355	564.7	6.3928	559.2	6.41205	553.7
6.3347	575.8	6.35395	570.3	6.3732	564.8	6.39245	559.3	6.4117	553.8
6.33435	575.9	6.3536	570.4	6.37285	564.9	6.3921	559.4	6.41135	553.9
6.334	576	6.35325	570.5	6.3725	565	6.39175	559.5	6.411	554
6.33365	576.1	6.3529	570.6	6.37215	565.1	6.3914	559.6	6.41065	554.1
6.3333	576.2	6.35255	570.7	6.3718	565.2	6.39105	559.7	6.4103	554.2
6.33295	576.3	6.3522	570.8	6.37145	565.3	6.3907	559.8	6.40995	554.3
6.3326	576.4	6.35185	570.9	6.3711	565.4	6.39035	559.9	6.4096	554.4
6.33225	576.5	6.3515	571	6.37075	565.5	6.39	560	6.40925	554.5
6.3319	576.6	6.35115	571.1	6.3704	565.6	6.38965	560.1	6.4089	554.6
6.33155	576.7	6.3508	571.2	6.37005	565.7	6.3893	560.2	6.40855	554.7
6.3312	576.8	6.35045	571.3	6.3697	565.8	6.38895	560.3	6.4082	554.8
6.33085	576.9	6.3501	571.4	6.36935	565.9	6.3886	560.4	6.40785	554.9
6.3305	577	6.34975	571.5	6.369	566	6.38825	560.5	6.4075	555
6.33015	577.1	6.3494	571.6	6.36865	566.1	6.3879	560.6	6.40715	555.1
6.3298	577.2	6.34905	571.7	6.3683	566.2	6.38755	560.7	6.4068	555.2
6.32945	577.3	6.3487	571.8	6.36795	566.3	6.3872	560.8	6.40645	555.3
6.3291	577.4	6.34835	571.9	6.3676	566.4	6.38685	560.9	6.4061	555.4
6.32875	577.5	6.348	572	6.36725	566.5	6.3865	561	6.40575	555.5
6.3284	577.6	6.34765	572.1	6.3669	566.6	6.38615	561.1	6.4054	555.6
6.32805	577.7	6.3473	572.2	6.36655	566.7	6.3858	561.2	6.40505	555.7
6.3277	577.8	6.34695	572.3	6.3662	566.8	6.38545	561.3	6.4047	555.8
6.32735	577.9	6.3466	572.4	6.36585	566.9	6.3851	561.4	6.40435	555.9
6.327	578	6.34625	572.5	6.3655	567	6.38475	561.5	6.404	556
6.32665	578.1	6.3459	572.6	6.36515	567.1	6.3844	561.6	6.40365	556.1
6.3263	578.2	6.34555	572.7	6.3648	567.2	6.38405	561.7	6.4033	556.2
6.32595	578.3	6.3452	572.8	6.36445	567.3	6.3837	561.8	6.40295	556.3
6.3256	578.4	6.34485	572.9	6.3641	567.4	6.38335	561.9	6.4026	556.4
6.32525	578.5	6.3445	573	6.36375	567.5	6.383	562	6.40225	556.5
6.3249	578.6	6.34415	573.1	6.3634	567.6	6.38265	562.1	6.4019	556.6
6.32455	578.7	6.3438	573.2	6.36305	567.7	6.3823	562.2	6.40155	556.7
6.3242	578.8	6.34345	573.3	6.3627	567.8	6.38195	562.3	6.4012	556.8
6.32385	578.9	6.3431	573.4	6.36235	567.9	6.3816	562.4	6.40085	556.9
6.3235	579	6.34275	573.5	6.362	568	6.38125	562.5	6.4005	557
6.32315	579.1	6.3424	573.6	6.36165	568.1	6.3809	562.6	6.40015	557.1
6.3228	579.2	6.34205	573.7	6.3613	568.2	6.38055	562.7	6.3998	557.2
6.32245	579.3	6.3417	573.8	6.36095	568.3	6.3802	562.8	6.39945	557.3
6.3221	579.4	6.34135	573.9	6.3606	568.4	6.37985	562.9	6.3991	557.4
6.32175	579.5	6.341	574	6.36025	568.5	6.3795	563	6.39875	557.5
6.3214	579.6	6.34065	574.1	6.3599	568.6	6.37915	563.1	6.3984	557.6
6.32105	579.7	6.3403	574.2	6.35955	568.7	6.3788	563.2	6.39805	557.7
6.3207	579.8	6.33995	574.3	6.3592	568.8	6.37845	563.3	6.3977	557.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.24335	601.9	6.2626	596.4	6.28185	590.9	6.3011	585.4	6.32035	579.9
6.243	602	6.26225	596.5	6.2815	591	6.30075	585.5	6.32	580
6.24265	602.1	6.2619	596.6	6.28115	591.1	6.3004	585.6	6.31965	580.1
6.2423	602.2	6.26155	596.7	6.2808	591.2	6.30005	585.7	6.3193	580.2
6.24195	602.3	6.2612	596.8	6.28045	591.3	6.2997	585.8	6.31895	580.3
6.2416	602.4	6.26085	596.9	6.2801	591.4	6.29935	585.9	6.3186	580.4
6.24125	602.5	6.2605	597	6.27975	591.5	6.299	586	6.31825	580.5
6.2409	602.6	6.26015	597.1	6.2794	591.6	6.29865	586.1	6.3179	580.6
6.24055	602.7	6.2598	597.2	6.27905	591.7	6.2983	586.2	6.31755	580.7
6.2402	602.8	6.25945	597.3	6.2787	591.8	6.29795	586.3	6.3172	580.8
6.23985	602.9	6.2591	597.4	6.27835	591.9	6.2976	586.4	6.31685	580.9
6.2395	603	6.25875	597.5	6.278	592	6.29725	586.5	6.3165	581
6.23915	603.1	6.2584	597.6	6.27765	592.1	6.2969	586.6	6.31615	581.1
6.2388	603.2	6.25805	597.7	6.2773	592.2	6.29655	586.7	6.3158	581.2
6.23845	603.3	6.2577	597.8	6.27695	592.3	6.2962	586.8	6.31545	581.3
6.2381	603.4	6.25735	597.9	6.2766	592.4	6.29585	586.9	6.3151	581.4
6.23775	603.5	6.257	598	6.27625	592.5	6.2955	587	6.31475	581.5
6.2374	603.6	6.25665	598.1	6.2759	592.6	6.29515	587.1	6.3144	581.6
6.23705	603.7	6.2563	598.2	6.27555	592.7	6.2948	587.2	6.31405	581.7
6.2367	603.8	6.25595	598.3	6.2752	592.8	6.29445	587.3	6.3137	581.8
6.23635	603.9	6.2556	598.4	6.27485	592.9	6.2941	587.4	6.31335	581.9
6.236	604	6.25525	598.5	6.2745	593	6.29375	587.5	6.313	582
6.23565	604.1	6.2549	598.6	6.27415	593.1	6.2934	587.6	6.31265	582.1
6.2353	604.2	6.25455	598.7	6.2738	593.2	6.29305	587.7	6.3123	582.2
6.23495	604.3	6.2542	598.8	6.27345	593.3	6.2927	587.8	6.31195	582.3
6.2346	604.4	6.25385	598.9	6.2731	593.4	6.29235	587.9	6.3116	582.4
6.23425	604.5	6.2535	599	6.27275	593.5	6.292	588	6.31125	582.5
6.2339	604.6	6.25315	599.1	6.2724	593.6	6.29165	588.1	6.3109	582.6
6.23355	604.7	6.2528	599.2	6.27205	593.7	6.2913	588.2	6.31055	582.7
6.2332	604.8	6.25245	599.3	6.2717	593.8	6.29095	588.3	6.3102	582.8
6.23285	604.9	6.2521	599.4	6.27135	593.9	6.2906	588.4	6.30985	582.9
6.2325	605	6.25175	599.5	6.271	594	6.29025	588.5	6.3095	583
6.23215	605.1	6.2514	599.6	6.27065	594.1	6.2899	588.6	6.30915	583.1
6.2318	605.2	6.25105	599.7	6.2703	594.2	6.28955	588.7	6.3088	583.2
6.23145	605.3	6.2507	599.8	6.26995	594.3	6.2892	588.8	6.30845	583.3
6.2311	605.4	6.25035	599.9	6.2696	594.4	6.28885	588.9	6.3081	583.4
6.23075	605.5	6.25	600	6.26925	594.5	6.2885	589	6.30775	583.5
6.2304	605.6	6.24965	600.1	6.2689	594.6	6.28815	589.1	6.3074	583.6
6.23005	605.7	6.2493	600.2	6.26855	594.7	6.2878	589.2	6.30705	583.7
6.2297	605.8	6.24895	600.3	6.2682	594.8	6.28745	589.3	6.3067	583.8
6.22935	605.9	6.2486	600.4	6.26785	594.9	6.2871	589.4	6.30635	583.9
6.229	606	6.24825	600.5	6.2675	595	6.28675	589.5	6.306	584
6.22865	606.1	6.2479	600.6	6.26715	595.1	6.2864	589.6	6.30565	584.1
6.2283	606.2	6.24755	600.7	6.2668	595.2	6.28605	589.7	6.3053	584.2
6.22795	606.3	6.2472	600.8	6.26645	595.3	6.2857	589.8	6.30495	584.3
6.2276	606.4	6.24685	600.9	6.2661	595.4	6.28535	589.9	6.3046	584.4
6.22725	606.5	6.2465	601	6.26575	595.5	6.285	590	6.30425	584.5
6.2269	606.6	6.24615	601.1	6.2654	595.6	6.28465	590.1	6.3039	584.6
6.22655	606.7	6.2458	601.2	6.26505	595.7	6.2843	590.2	6.30355	584.7
6.2262	606.8	6.24545	601.3	6.2647	595.8	6.28395	590.3	6.3032	584.8
6.22585	606.9	6.2451	601.4	6.26435	595.9	6.2836	590.4	6.30285	584.9
6.2255	607	6.24475	601.5	6.264	596	6.28325	590.5	6.3025	585
6.22515	607.1	6.2444	601.6	6.26365	596.1	6.2829	590.6	6.30215	585.1
6.2248	607.2	6.24405	601.7	6.2633	596.2	6.28255	590.7	6.3018	585.2
6.22445	607.3	6.2437	601.8	6.26295	596.3	6.2822	590.8	6.30145	585.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.1471	629.4	6.16635	623.9	6.1856	618.4	6.20485	612.9	6.2241	607.4
6.14675	629.5	6.166	624	6.18525	618.5	6.2045	613	6.22375	607.5
6.1464	629.6	6.16565	624.1	6.1849	618.6	6.20415	613.1	6.2234	607.6
6.14605	629.7	6.1653	624.2	6.18455	618.7	6.2038	613.2	6.22305	607.7
6.1457	629.8	6.16495	624.3	6.1842	618.8	6.20345	613.3	6.2227	607.8
6.14535	629.9	6.1646	624.4	6.18385	618.9	6.2031	613.4	6.22235	607.9
6.145	630	6.16425	624.5	6.1835	619	6.20275	613.5	6.222	608
6.14465	630.1	6.1639	624.6	6.18315	619.1	6.2024	613.6	6.22165	608.1
6.1443	630.2	6.16355	624.7	6.1828	619.2	6.20205	613.7	6.2213	608.2
6.14395	630.3	6.1632	624.8	6.18245	619.3	6.2017	613.8	6.22095	608.3
6.1436	630.4	6.16285	624.9	6.1821	619.4	6.20135	613.9	6.2206	608.4
6.14325	630.5	6.1625	625	6.18175	619.5	6.201	614	6.22025	608.5
6.1429	630.6	6.16215	625.1	6.1814	619.6	6.20065	614.1	6.2199	608.6
6.14255	630.7	6.1618	625.2	6.18105	619.7	6.2003	614.2	6.21955	608.7
6.1422	630.8	6.16145	625.3	6.1807	619.8	6.19995	614.3	6.2192	608.8
6.14185	630.9	6.1611	625.4	6.18035	619.9	6.1996	614.4	6.21885	608.9
6.1415	631	6.16075	625.5	6.18	620	6.19925	614.5	6.2185	609
6.14115	631.1	6.1604	625.6	6.17965	620.1	6.1989	614.6	6.21815	609.1
6.1408	631.2	6.16005	625.7	6.1793	620.2	6.19855	614.7	6.2178	609.2
6.14045	631.3	6.1597	625.8	6.17895	620.3	6.1982	614.8	6.21745	609.3
6.1401	631.4	6.15935	625.9	6.1786	620.4	6.19785	614.9	6.2171	609.4
6.13975	631.5	6.159	626	6.17825	620.5	6.1975	615	6.21675	609.5
6.1394	631.6	6.15865	626.1	6.1779	620.6	6.19715	615.1	6.2164	609.6
6.13905	631.7	6.1583	626.2	6.17755	620.7	6.1968	615.2	6.21605	609.7
6.1387	631.8	6.15795	626.3	6.1772	620.8	6.19645	615.3	6.2157	609.8
6.13835	631.9	6.1576	626.4	6.17685	620.9	6.1961	615.4	6.21535	609.9
6.138	632	6.15725	626.5	6.1765	621	6.19575	615.5	6.215	610
6.13765	632.1	6.1569	626.6	6.17615	621.1	6.1954	615.6	6.21465	610.1
6.1373	632.2	6.15655	626.7	6.1758	621.2	6.19505	615.7	6.2143	610.2
6.13695	632.3	6.1562	626.8	6.17545	621.3	6.1947	615.8	6.21395	610.3
6.1366	632.4	6.15585	626.9	6.1751	621.4	6.19435	615.9	6.2136	610.4
6.13625	632.5	6.1555	627	6.17475	621.5	6.194	616	6.21325	610.5
6.1359	632.6	6.15515	627.1	6.1744	621.6	6.19365	616.1	6.2129	610.6
6.13555	632.7	6.1548	627.2	6.17405	621.7	6.1933	616.2	6.21255	610.7
6.1352	632.8	6.15445	627.3	6.1737	621.8	6.19295	616.3	6.2122	610.8
6.13485	632.9	6.1541	627.4	6.17335	621.9	6.1926	616.4	6.21185	610.9
6.1345	633	6.15375	627.5	6.173	622	6.19225	616.5	6.2115	611
6.13415	633.1	6.1534	627.6	6.17265	622.1	6.1919	616.6	6.21115	611.1
6.1338	633.2	6.15305	627.7	6.1723	622.2	6.19155	616.7	6.2108	611.2
6.13345	633.3	6.1527	627.8	6.17195	622.3	6.1912	616.8	6.21045	611.3
6.1331	633.4	6.15235	627.9	6.1716	622.4	6.19085	616.9	6.2101	611.4
6.13275	633.5	6.152	628	6.17125	622.5	6.1905	617	6.20975	611.5
6.1324	633.6	6.15165	628.1	6.1709	622.6	6.19015	617.1	6.2094	611.6
6.13205	633.7	6.1513	628.2	6.17055	622.7	6.1898	617.2	6.20905	611.7
6.1317	633.8	6.15095	628.3	6.1702	622.8	6.18945	617.3	6.2087	611.8
6.13135	633.9	6.1506	628.4	6.16985	622.9	6.1891	617.4	6.20835	611.9
6.131	634	6.15025	628.5	6.1695	623	6.18875	617.5	6.208	612
6.13065	634.1	6.1499	628.6	6.16915	623.1	6.1884	617.6	6.20765	612.1
6.1303	634.2	6.14955	628.7	6.1688	623.2	6.18805	617.7	6.2073	612.2
6.12995	634.3	6.1492	628.8	6.16845	623.3	6.1877	617.8	6.20695	612.3
6.1296	634.4	6.14885	628.9	6.1681	623.4	6.18735	617.9	6.2066	612.4
6.12925	634.5	6.1485	629	6.16775	623.5	6.187	618	6.20625	612.5
6.1289	634.6	6.14815	629.1	6.1674	623.6	6.18665	618.1	6.2059	612.6
6.12855	634.7	6.1478	629.2	6.16705	623.7	6.1863	618.2	6.20555	612.7
6.1282	634.8	6.14745	629.3	6.1667	623.8	6.18595	618.3	6.2052	612.8

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
6.05085	656.9	6.0701	651.4	6.08935	645.9	6.1086	640.4	6.12785	634.9
6.0505	657	6.06975	651.5	6.089	646	6.10825	640.5	6.1275	635
6.05015	657.1	6.0694	651.6	6.08865	646.1	6.1079	640.6	6.12715	635.1
6.0498	657.2	6.06905	651.7	6.0883	646.2	6.10755	640.7	6.1268	635.2
6.04945	657.3	6.0687	651.8	6.08795	646.3	6.1072	640.8	6.12645	635.3
6.0491	657.4	6.06835	651.9	6.0876	646.4	6.10685	640.9	6.1261	635.4
6.04875	657.5	6.068	652	6.08725	646.5	6.1065	641	6.12575	635.5
6.0484	657.6	6.06765	652.1	6.0869	646.6	6.10615	641.1	6.1254	635.6
6.04805	657.7	6.0673	652.2	6.08655	646.7	6.1058	641.2	6.12505	635.7
6.0477	657.8	6.06695	652.3	6.0862	646.8	6.10545	641.3	6.1247	635.8
6.04735	657.9	6.0666	652.4	6.08585	646.9	6.1051	641.4	6.12435	635.9
6.047	658	6.06625	652.5	6.0855	647	6.10475	641.5	6.124	636
6.04665	658.1	6.0659	652.6	6.08515	647.1	6.1044	641.6	6.12365	636.1
6.0463	658.2	6.06555	652.7	6.0848	647.2	6.10405	641.7	6.1233	636.2
6.04595	658.3	6.0652	652.8	6.08445	647.3	6.1037	641.8	6.12295	636.3
6.0456	658.4	6.06485	652.9	6.0841	647.4	6.10335	641.9	6.1226	636.4
6.04525	658.5	6.0645	653	6.08375	647.5	6.103	642	6.12225	636.5
6.0449	658.6	6.06415	653.1	6.0834	647.6	6.10265	642.1	6.1219	636.6
6.04455	658.7	6.0638	653.2	6.08305	647.7	6.1023	642.2	6.12155	636.7
6.0442	658.8	6.06345	653.3	6.0827	647.8	6.10195	642.3	6.1212	636.8
6.04385	658.9	6.0631	653.4	6.08235	647.9	6.1016	642.4	6.12085	636.9
6.0435	659	6.06275	653.5	6.082	648	6.10125	642.5	6.1205	637
6.04315	659.1	6.0624	653.6	6.08165	648.1	6.1009	642.6	6.12015	637.1
6.0428	659.2	6.06205	653.7	6.0813	648.2	6.10055	642.7	6.1198	637.2
6.04245	659.3	6.0617	653.8	6.08095	648.3	6.1002	642.8	6.11945	637.3
6.0421	659.4	6.06135	653.9	6.0806	648.4	6.09985	642.9	6.1191	637.4
6.04175	659.5	6.061	654	6.08025	648.5	6.0995	643	6.11875	637.5
6.0414	659.6	6.06065	654.1	6.0799	648.6	6.09915	643.1	6.1184	637.6
6.04105	659.7	6.0603	654.2	6.07955	648.7	6.0988	643.2	6.11805	637.7
6.0407	659.8	6.05995	654.3	6.0792	648.8	6.09845	643.3	6.1177	637.8
6.04035	659.9	6.0596	654.4	6.07885	648.9	6.0981	643.4	6.11735	637.9
6.04	660	6.05925	654.5	6.0785	649	6.09775	643.5	6.117	638
6.03965	660.1	6.0589	654.6	6.07815	649.1	6.0974	643.6	6.11665	638.1
6.0393	660.2	6.05855	654.7	6.0778	649.2	6.09705	643.7	6.1163	638.2
6.03895	660.3	6.0582	654.8	6.07745	649.3	6.0967	643.8	6.11595	638.3
6.0386	660.4	6.05785	654.9	6.0771	649.4	6.09635	643.9	6.1156	638.4
6.03825	660.5	6.0575	655	6.07675	649.5	6.096	644	6.11525	638.5
6.0379	660.6	6.05715	655.1	6.0764	649.6	6.09565	644.1	6.1149	638.6
6.03755	660.7	6.0568	655.2	6.07605	649.7	6.0953	644.2	6.11455	638.7
6.0372	660.8	6.05645	655.3	6.0757	649.8	6.09495	644.3	6.1142	638.8
6.03685	660.9	6.0561	655.4	6.07535	649.9	6.0946	644.4	6.11385	638.9
6.0365	661	6.05575	655.5	6.075	650	6.09425	644.5	6.1135	639
6.03615	661.1	6.0554	655.6	6.07465	650.1	6.0939	644.6	6.11315	639.1
6.0358	661.2	6.05505	655.7	6.0743	650.2	6.09355	644.7	6.1128	639.2
6.03545	661.3	6.0547	655.8	6.07395	650.3	6.0932	644.8	6.11245	639.3
6.0351	661.4	6.05435	655.9	6.0736	650.4	6.09285	644.9	6.1121	639.4
6.03475	661.5	6.054	656	6.07325	650.5	6.0925	645	6.11175	639.5
6.0344	661.6	6.05365	656.1	6.0729	650.6	6.09215	645.1	6.1114	639.6
6.03405	661.7	6.0533	656.2	6.07255	650.7	6.0918	645.2	6.11105	639.7
6.0337	661.8	6.05295	656.3	6.0722	650.8	6.09145	645.3	6.1107	639.8
6.03335	661.9	6.0526	656.4	6.07185	650.9	6.0911	645.4	6.11035	639.9
6.033	662	6.05225	656.5	6.0715	651	6.09075	645.5	6.11	640
6.03265	662.1	6.0519	656.6	6.07115	651.1	6.0904	645.6	6.10965	640.1
6.0323	662.2	6.05155	656.7	6.0708	651.2	6.09005	645.7	6.1093	640.2
6.03195	662.3	6.0512	656.8	6.07045	651.3	6.0897	645.8	6.10895	640.3

טבלאות K12

k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser	k12	f-ser
5.9546	684.4	5.97385	678.9	5.9931	673.4	6.01235	667.9	6.0316	662.4
5.95425	684.5	5.9735	679	5.99275	673.5	6.012	668	6.03125	662.5
5.9539	684.6	5.97315	679.1	5.9924	673.6	6.01165	668.1	6.0309	662.6
5.95355	684.7	5.9728	679.2	5.99205	673.7	6.0113	668.2	6.03055	662.7
5.9532	684.8	5.97245	679.3	5.9917	673.8	6.01095	668.3	6.0302	662.8
5.95285	684.9	5.9721	679.4	5.99135	673.9	6.0106	668.4	6.02985	662.9
5.9525	685	5.97175	679.5	5.991	674	6.01025	668.5	6.0295	663
5.95215	685.1	5.9714	679.6	5.99065	674.1	6.0099	668.6	6.02915	663.1
5.9518	685.2	5.97105	679.7	5.9903	674.2	6.00955	668.7	6.0288	663.2
5.95145	685.3	5.9707	679.8	5.98995	674.3	6.0092	668.8	6.02845	663.3
5.9511	685.4	5.97035	679.9	5.9896	674.4	6.00885	668.9	6.0281	663.4
5.95075	685.5	5.97	680	5.98925	674.5	6.0085	669	6.02775	663.5
5.9504	685.6	5.96965	680.1	5.9889	674.6	6.00815	669.1	6.0274	663.6
5.95005	685.7	5.9693	680.2	5.98855	674.7	6.0078	669.2	6.02705	663.7
5.9497	685.8	5.96895	680.3	5.9882	674.8	6.00745	669.3	6.0267	663.8
5.94935	685.9	5.9686	680.4	5.98785	674.9	6.0071	669.4	6.02635	663.9
5.949	686	5.96825	680.5	5.9875	675	6.00675	669.5	6.026	664
5.94865	686.1	5.9679	680.6	5.98715	675.1	6.0064	669.6	6.02565	664.1
5.9483	686.2	5.96755	680.7	5.9868	675.2	6.00605	669.7	6.0253	664.2
5.94795	686.3	5.9672	680.8	5.98645	675.3	6.0057	669.8	6.02495	664.3
5.9476	686.4	5.96685	680.9	5.9861	675.4	6.00535	669.9	6.0246	664.4
5.94725	686.5	5.9665	681	5.98575	675.5	6.005	670	6.02425	664.5
5.9469	686.6	5.96615	681.1	5.9854	675.6	6.00465	670.1	6.0239	664.6
5.94655	686.7	5.9658	681.2	5.98505	675.7	6.0043	670.2	6.02355	664.7
5.9462	686.8	5.96545	681.3	5.9847	675.8	6.00395	670.3	6.0232	664.8
5.94585	686.9	5.9651	681.4	5.98435	675.9	6.0036	670.4	6.02285	664.9
5.9455	687	5.96475	681.5	5.984	676	6.00325	670.5	6.0225	665
5.94515	687.1	5.9644	681.6	5.98365	676.1	6.0029	670.6	6.02215	665.1
5.9448	687.2	5.96405	681.7	5.9833	676.2	6.00255	670.7	6.0218	665.2
5.94445	687.3	5.9637	681.8	5.98295	676.3	6.0022	670.8	6.02145	665.3
5.9441	687.4	5.96335	681.9	5.9826	676.4	6.00185	670.9	6.0211	665.4
5.94375	687.5	5.963	682	5.98225	676.5	6.0015	671	6.02075	665.5
5.9434	687.6	5.96265	682.1	5.9819	676.6	6.00115	671.1	6.0204	665.6
5.94305	687.7	5.9623	682.2	5.98155	676.7	6.0008	671.2	6.02005	665.7
5.9427	687.8	5.96195	682.3	5.9812	676.8	6.00045	671.3	6.0197	665.8
5.94235	687.9	5.9616	682.4	5.98085	676.9	6.0001	671.4	6.01935	665.9
5.942	688	5.96125	682.5	5.9805	677	5.99975	671.5	6.019	666
5.94165	688.1	5.9609	682.6	5.98015	677.1	5.9994	671.6	6.01865	666.1
5.9413	688.2	5.96055	682.7	5.9798	677.2	5.99905	671.7	6.0183	666.2
5.94095	688.3	5.9602	682.8	5.97945	677.3	5.9987	671.8	6.01795	666.3
5.9406	688.4	5.95985	682.9	5.9791	677.4	5.99835	671.9	6.0176	666.4
5.94025	688.5	5.9595	683	5.97875	677.5	5.998	672	6.01725	666.5
5.9399	688.6	5.95915	683.1	5.9784	677.6	5.99765	672.1	6.0169	666.6
5.93955	688.7	5.9588	683.2	5.97805	677.7	5.9973	672.2	6.01655	666.7
5.9392	688.8	5.95845	683.3	5.9777	677.8	5.99695	672.3	6.0162	666.8
5.93885	688.9	5.9581	683.4	5.97735	677.9	5.9966	672.4	6.01585	666.9
5.9385	689	5.95775	683.5	5.977	678	5.99625	672.5	6.0155	667
5.93815	689.1	5.9574	683.6	5.97665	678.1	5.9959	672.6	6.01515	667.1
5.9378	689.2	5.95705	683.7	5.9763	678.2	5.99555	672.7	6.0148	667.2
5.93745	689.3	5.9567	683.8	5.97595	678.3	5.9952	672.8	6.01445	667.3
5.9371	689.4	5.95635	683.9	5.9756	678.4	5.99485	672.9	6.0141	667.4
5.93675	689.5	5.956	684	5.97525	678.5	5.9945	673	6.01375	667.5
5.9364	689.6	5.95565	684.1	5.9749	678.6	5.99415	673.1	6.0134	667.6
5.93605	689.7	5.9553	684.2	5.97455	678.7	5.9938	673.2	6.01305	667.7
5.9357	689.8	5.95495	684.3	5.9742	678.8	5.99345	673.3	6.0127	667.8

טבלאות K12

k12	f-ser	k12	f-ser
5.9161	695.4	5.93535	689.9
5.91575	695.5	5.935	690
5.9154	695.6	5.93465	690.1
5.91505	695.7	5.9343	690.2
5.9147	695.8	5.93395	690.3
5.91435	695.9	5.9336	690.4
5.914	696	5.93325	690.5
5.91365	696.1	5.9329	690.6
5.9133	696.2	5.93255	690.7
5.91295	696.3	5.9322	690.8
5.9126	696.4	5.93185	690.9
5.91225	696.5	5.9315	691
5.9119	696.6	5.93115	691.1
5.91155	696.7	5.9308	691.2
5.9112	696.8	5.93045	691.3
5.91085	696.9	5.9301	691.4
5.9105	697	5.92975	691.5
5.91015	697.1	5.9294	691.6
5.9098	697.2	5.92905	691.7
5.90945	697.3	5.9287	691.8
5.9091	697.4	5.92835	691.9
5.90875	697.5	5.928	692
5.9084	697.6	5.92765	692.1
5.90805	697.7	5.9273	692.2
5.9077	697.8	5.92695	692.3
5.90735	697.9	5.9266	692.4
5.907	698	5.92625	692.5
5.90665	698.1	5.9259	692.6
5.9063	698.2	5.92555	692.7
5.90595	698.3	5.9252	692.8
5.9056	698.4	5.92485	692.9
5.90525	698.5	5.9245	693
5.9049	698.6	5.92415	693.1
5.90455	698.7	5.9238	693.2
5.9042	698.8	5.92345	693.3
5.90385	698.9	5.9231	693.4
5.9035	699	5.92275	693.5
5.90315	699.1	5.9224	693.6
5.9028	699.2	5.92205	693.7
5.90245	699.3	5.9217	693.8
5.9021	699.4	5.92135	693.9
5.90175	699.5	5.921	694
5.9014	699.6	5.92065	694.1
5.90105	699.7	5.9203	694.2
5.9007	699.8	5.91995	694.3
5.90035	699.9	5.9196	694.4
5.9	700	5.91925	694.5
		5.9189	694.6
		5.91855	694.7
		5.9182	694.8
		5.91785	694.9
		5.9175	695
		5.91715	695.1
		5.9168	695.2
		5.91645	695.3

משקל, היקף ושטח של מוטות עגולים

שטחי זיון עבור קורות, תקרת צלעות & עמודים

קוטר (mm)	משקל של מ"י אורך (Kg)	היקף (cm)	שטח למספר מוטות (cm ²)										קוטר (mm)
			1	2	3	4	5	6	7	8	9	10	
3	0.055	0.94	0.07	0.14	0.21	0.28	0.35	0.42	0.49	0.57	0.64	0.71	3
4	0.099	1.26	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.01	1.13	1.26	4
5	0.154	1.57	0.20	0.39	0.59	0.78	0.98	1.18	1.37	1.57	1.76	1.96	5
6	0.222	1.88	0.28	0.56	0.85	1.13	1.41	1.70	1.98	2.26	2.54	2.83	6
8	0.395	2.51	0.50	1.00	1.51	2.01	2.51	3.01	3.52	4.02	4.52	5.03	8
10	0.617	3.14	0.79	1.57	2.36	3.14	3.93	4.71	5.50	6.28	7.07	7.85	10
12	0.888	3.77	1.13	2.26	3.39	4.52	5.65	6.79	7.92	9.05	10.18	11.31	12
14	1.208	4.40	1.54	3.08	4.62	6.16	7.70	9.24	10.78	12.32	13.86	15.39	14
16	1.578	5.03	2.01	4.02	6.03	8.04	10.05	12.06	14.07	16.08	18.09	20.11	16
18	1.998	5.65	2.54	5.09	7.63	10.18	12.72	15.26	17.81	20.36	22.90	25.45	18
20	2.466	6.28	3.14	6.28	9.42	12.57	15.71	18.84	21.99	25.14	28.28	31.42	20
22	2.98	6.91	3.80	7.60	11.40	15.20	19.01	22.81	26.61	30.41	34.21	38.01	22
24	3.55	7.54	4.52	9.05	13.57	18.10	22.62	27.14	31.67	36.19	40.72	45.24	24
25	3.85	7.85	4.91	9.82	14.73	19.63	24.54	29.45	34.36	39.27	44.18	49.09	25
26	4.17	8.17	5.31	10.62	15.93	21.24	26.55	31.86	37.17	42.47	47.78	53.09	26
28	4.83	8.80	6.16	12.31	18.47	24.23	30.79	36.94	43.10	49.26	55.41	61.57	28
30	5.55	9.42	7.07	14.14	21.21	28.28	35.35	42.41	49.48	56.55	63.62	70.69	30
32	6.31	10.05	8.04	16.08	24.13	32.17	40.21	48.25	56.29	64.34	72.38	80.42	32
34	7.13	10.68	9.08	18.16	27.24	36.32	45.40	54.48	63.56	72.63	81.71	90.79	34
36	7.99	11.31	10.18	20.36	30.54	40.72	50.90	61.07	71.25	81.43	91.61	101.79	36
38	8.90	11.94	11.34	22.18	34.02	45.36	56.70	68.04	79.38	90.73	102.07	113.41	38
40	9.86	12.57	12.57	25.13	37.70	50.27	62.83	75.40	87.96	100.53	113.10	125.66	40
45	12.48	14.14	15.90	31.81	47.71	63.62	79.52	95.42	111.33	127.33	143.14	159.04	45
50	15.41	15.71	19.64	39.27	58.91	78.54	98.15	117.81	137.45	157.08	176.72	196.35	50

שטח זיון עבור תקרה מקשית & מצולבת ויסודות

שטח זיון בסמ"ר למטר רוחב פלטה

(@ = המרחק בין המוטות)

@ (cm)	הקוטר (mm)									@ (cm)
	6	8	10	12	14	16	18	20	22	
7.0	4.04	7.18	11.22	16.16	21.99	28.73	36.36	44.87	54.28	7.0
7.5	3.77	6.70	10.47	15.08	20.52	26.81	33.93	41.88	50.67	7.5
8.0	3.53	6.28	9.82	14.14	19.24	25.14	31.81	39.26	47.50	8.0
8.5	3.33	5.91	9.24	13.31	18.11	23.66	29.94	36.95	44.71	8.5
9.0	3.14	5.59	8.73	12.57	17.10	22.34	28.28	34.90	42.22	9.0
9.5	2.98	5.29	8.27	11.90	16.20	21.17	26.79	33.06	40.00	9.5
10.0	2.83	5.03	7.85	11.31	15.39	20.11	25.45	31.41	38.00	10.0
10.5	2.69	4.79	7.48	10.77	14.66	19.15	24.24	29.91	36.19	10.5
11.0	2.57	4.57	7.14	10.28	13.99	18.28	23.14	28.55	34.55	11.0
11.5	2.46	4.37	6.83	9.84	13.39	17.49	22.13	27.31	33.04	11.5
12.0	2.36	4.19	6.54	9.42	12.83	16.76	21.21	26.17	31.67	12.0
12.5	2.26	4.02	6.28	9.05	12.32	16.09	20.36	25.13	30.40	12.5
13.0	2.17	3.87	6.04	8.70	11.84	15.47	19.58	24.16	29.23	13.0
13.5	2.09	3.72	5.82	8.38	11.40	14.90	18.85	23.27	28.15	13.5
14.0	2.02	3.59	5.61	8.08	11.00	14.36	18.18	22.44	27.14	14.0
14.5	1.95	3.47	5.42	7.80	10.62	13.87	17.55	21.66	26.21	14.5
15.0	1.89	3.35	5.24	7.54	10.26	13.41	16.97	20.94	25.33	15.0
15.5	1.82	3.24	5.07	7.30	9.93	12.97	16.42	20.27	24.52	15.5
16.0	1.77	3.14	4.91	7.07	9.62	12.57	15.90	19.64	23.88	16.0
16.5	1.71	3.05	4.76	6.85	9.33	12.19	15.42	19.04	23.03	16.5
17.0	1.66	2.96	4.62	6.65	9.05	11.83	14.97	18.48	22.35	17.0
17.5	1.62	2.87	4.49	6.46	8.79	11.49	14.54	17.95	21.71	17.5
18.0	1.57	2.79	4.36	6.28	8.55	11.17	14.14	17.46	21.11	18.0
18.5	1.53	2.72	4.25	6.11	8.32	10.87	13.76	16.94	20.54	18.5
19.0	1.49	2.65	4.13	5.95	8.10	10.58	13.39	16.54	20.00	19.0
19.5	1.45	2.58	4.03	5.80	7.89	10.31	13.05	16.11	19.49	19.5
20.0	1.41	2.51	3.93	5.65	7.69	10.05	12.72	15.72	19.00	20.0
21.0	1.35	2.39	3.74	5.38	7.33	9.55	12.11	14.96	18.09	21.0
22.0	1.29	2.28	3.57	5.14	6.99	9.12	11.56	14.28	17.27	22.0
23.0	1.23	2.18	3.41	4.91	6.69	8.72	11.06	13.66	16.52	23.0
24.0	1.18	2.09	3.27	4.71	6.41	8.36	10.60	13.09	15.83	24.0
25.0	1.13	2.01	3.14	4.52	6.15	8.03	10.17	12.57	15.20	25.0
26.0	1.09	1.93	3.02	4.35	5.92	7.72	9.78	12.08	14.61	26.0
27.0	1.05	1.86	2.91	4.19	5.70	7.43	9.42	11.64	14.07	27.0
28.0	1.01	1.79	2.80	4.04	5.49	7.16	9.08	11.22	13.57	28.0
29.0	0.97	1.73	2.71	3.90	5.31	6.92	8.77	10.83	13.10	29.0
30.0	0.94	1.67	2.62	3.77	5.13	6.69	8.48	10.47	12.66	30.0
31.0	0.91	1.62	2.53	3.65	4.96	6.47	8.20	10.13	12.26	31.0
32.0	0.88	1.57	2.45	3.53	4.81	6.27	7.95	9.82	11.87	32.0
33.0	0.86	1.52	2.38	3.43	4.66	6.08	7.71	9.52	11.51	33.0

טבלת עזר לשימוש בטבלה 18 –
החלפת עומס אמיתי לעומס רצוף

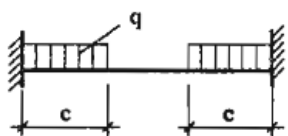
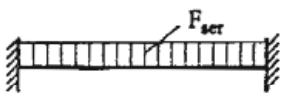
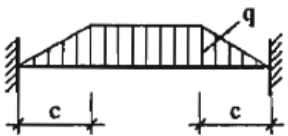
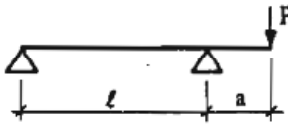
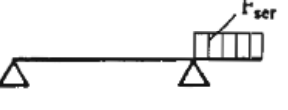
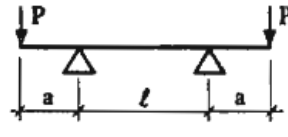
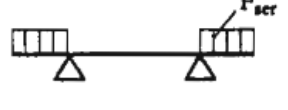
מס'	העמסה אמיתית	העמסה לצורך שימוש בטבלה 18	הקשר בין העומס האמיתי לעומס בטבלה 18
1			$F_{ser} = \frac{2.67P}{l}$
2			$F_{ser} = 0.733 q$
3			$F_{ser} = 0.267 q$
4			$F_{ser} = 0.458 q$
5			$c = \frac{l}{4} \quad F_{ser} = 0.54 q$ $c = \frac{l}{3} \quad F_{ser} = 0.67 q$ $c = \frac{l}{2} \quad F_{ser} = 0.854 q$
6			$c = \frac{l}{4} \quad F_{ser} = 0.02 q$ $c = \frac{l}{3} \quad F_{ser} = 0.045 q$ $c = \frac{l}{2} \quad F_{ser} = 0.146 q$
7			$F_{ser} = \frac{4M}{l^2}$
8			$c = \frac{l}{4} \quad F_{ser} = 1.12 \frac{P}{l}$ $c = \frac{l}{3} \quad F_{ser} = 1.376 \frac{P}{l}$ $c = \frac{l}{2} \quad F_{ser} = 1.60 \frac{P}{l}$
9			$c = \frac{l}{4} \quad F_{ser} = \frac{2.20P}{l}$ $c = \frac{l}{3} \quad F_{ser} = \frac{2.73P}{l}$
10			$c = \frac{l}{4} \quad F_{ser} = 0.15 q$ $c = \frac{l}{3} \quad F_{ser} = 0.25 q$ $c = \frac{l}{2} \quad F_{ser} = 0.50 q$

מס' חעמסה	חעמסה אמיתית	העמסה לצורך שימוש בטבלה 18	חקר בין העומס האמיתי לעומס בטבלה 18
11			$c = \frac{l}{4} \quad F_{ser} = 0.29 q$ $c = \frac{l}{3} \quad F_{ser} = 0.49 q$ $c = \frac{l}{2} \quad F_{ser} = q$
12			$F_{ser} = 0.50 q$
13			$F_{ser} = 0.64 q$
14			$c = \frac{l}{4} \quad F_{ser} = 0.90 q$ $c = \frac{l}{3} \quad F_{ser} = 0.83 q$
15			$F_{ser} = 4.93 \frac{M}{l^2}$
16			$c = \frac{l}{4} \quad F_{ser} = \frac{0.75P}{l}$ $c = \frac{l}{3} \quad F_{ser} = \frac{1.14P}{l}$ $c = \frac{l}{2} \quad F_{ser} = \frac{1.72P}{l}$
17			$c = \frac{l}{4} \quad F_{ser} = \frac{1.29P}{l}$ $c = \frac{l}{3} \quad F_{ser} = \frac{1.57P}{l}$ $c = \frac{l}{2} \quad F_{ser} = \frac{1.72P}{l}$
18			$c = \frac{l}{2} \quad F_{ser} = \frac{2.04P}{l}$ $c = \frac{l}{3} \quad F_{ser} = \frac{2.71P}{l}$
19			$c = \frac{l}{4} \quad F_{ser} = 0.07 q$ $c = \frac{l}{3} \quad F_{ser} = 0.15 q$ $c = \frac{l}{2} \quad F_{ser} = 0.40 q$

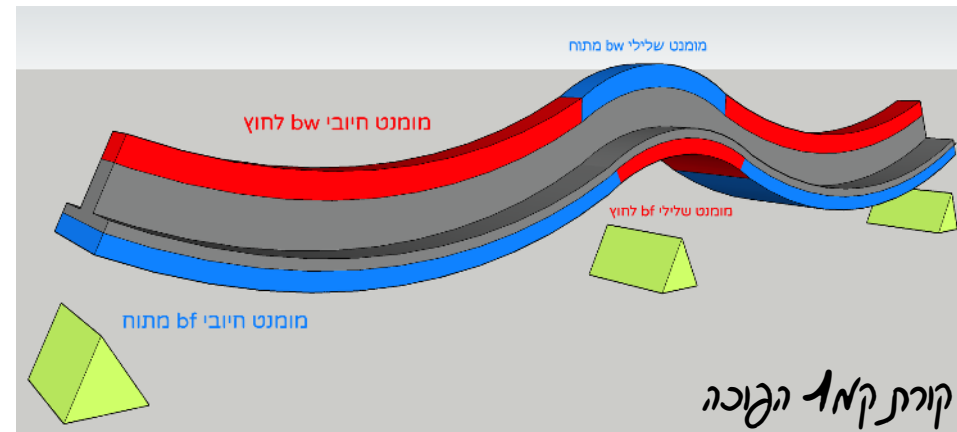
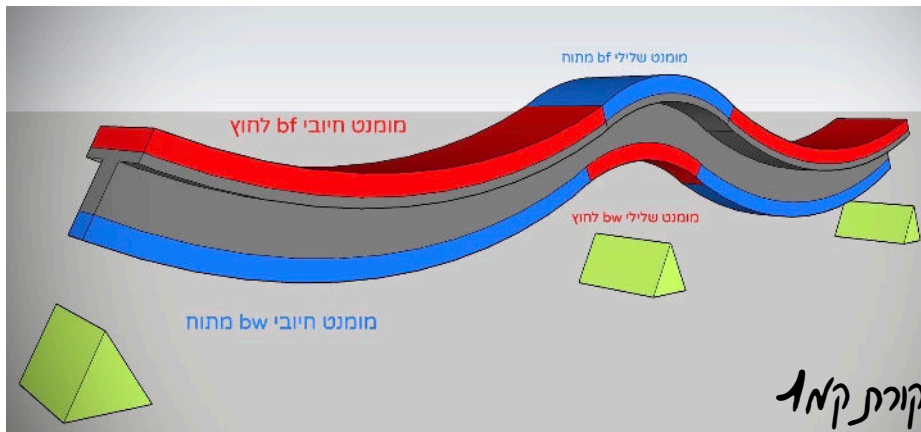
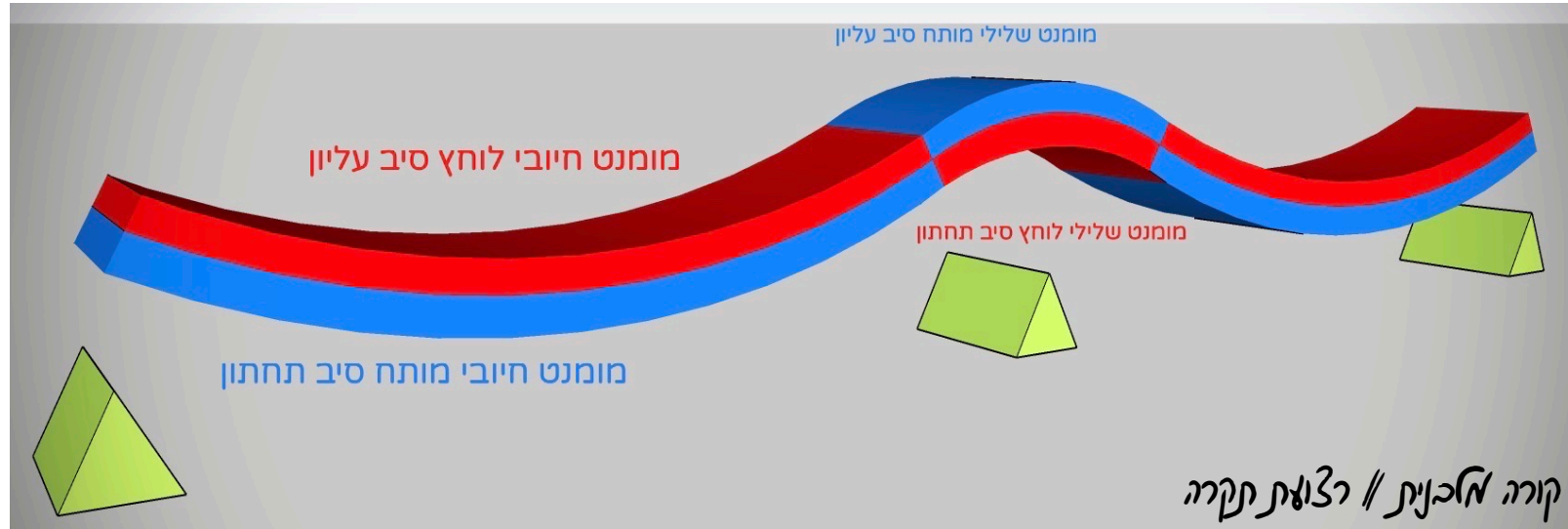
המשך

מס'	העמסה אמיתית	העמסה לצורך שימוש בטבלה 18	הקשר בין העומס האמיתי לעומס בטבלה 18
20			$c = \frac{l}{4} \quad F_{ser} = 0.17 q$ $c = \frac{l}{3} \quad F_{ser} = 0.29 q$ $c = \frac{l}{2} \quad F_{ser} = 0.60 q$
21			$c = \frac{l}{4} \quad F_{ser} = 0.24 q$ $c = \frac{l}{3} \quad F_{ser} = 0.44 q$ $c = \frac{l}{2} \quad F_{ser} = q$
22			$F_{ser} = 0.56 q$
23			$F_{ser} = 0.44 q$
24			$F_{ser} = 0.613 q$
25			$c = \frac{l}{4} \quad F_{ser} = 0.85 q$ $c = \frac{l}{3} \quad F_{ser} = 0.79 q$
26			$F_{ser} = \frac{6.84M}{l^2}$
27			$c = \frac{l}{4} \quad F_{ser} = \frac{P}{l}$ $c = \frac{l}{3} \quad F_{ser} = \frac{1.48P}{l}$ $c = \frac{l}{2} \quad F_{ser} = \frac{2P}{l}$
28			$c = \frac{l}{4} \quad F_{ser} = \frac{2P}{l}$ $c = \frac{l}{3} \quad F_{ser} = \frac{2.96P}{l}$
29			$c = \frac{l}{4} \quad F_{ser} = 0.095 q$ $c = \frac{l}{3} \quad F_{ser} = 0.20 q$ $c = \frac{l}{2} \quad F_{ser} = 0.5 q$

המשך

מס'	העמסה אמיתית	העמסה לצורך שימוש בטבלה 18	הקשר בין העומס האמיתי לעומס בטבלה 18
30			$c = \frac{\ell}{4} \quad F_{ser} = 0.19 q$ $c = \frac{\ell}{3} \quad F_{ser} = 0.40 q$
31			$F_{ser} = 0.503 q$
32			$F_{ser} = 0.70 q$
33			$c = \frac{\ell}{4} \quad F_{ser} = 0.95 q$ $c = \frac{\ell}{3} \quad F_{ser} = 0.89 q$
34			$F_{ser} = \frac{2.2P}{a} \quad a > 0.2\ell$ $F_{ser} = \frac{2.1P}{a} \quad a < 0.2\ell$
35			$F_{ser} = \frac{2.13P}{a} \quad a > 0.2\ell$ $F_{ser} = \frac{2.05P}{a} \quad a < 0.2\ell$

מודל כפיפת תקרה & קורות לזיהוי סיב לחוץ / מתוח



טבלאות עזר - תקן 466

5.3.6. זיון מינימלי לכפיפה
 בכל מקרה, מנת הזיון המתוח בחתך בטון מזוין למניעת הרס פריך לא תהיה קטנה מחתך:

$$\rho_{min} = \frac{A_{s,min}}{b_d d} = 0.28 \frac{f_{cm}}{f_{td}} \quad (5.4)$$

 ובלבד שיתקיים: בפלדה פ-500W וברשתות מרותכות
 $\rho_{min} \geq 0.0013$
 בפלדה פ-400W
 $\rho_{min} \geq 0.0015$
 בפלדה פ-240
 $\rho_{min} \geq 0.0026$
 בנוסחה זו:
 b_d – רוחב סמוצע של הבטון באזור המתוח של החתך
 כאשר בחתך קסץ או ריש האנף נמצא בלחיצה, יש להציב בנוסחה b_w במקום b_d .

טבלה 3.1 - סיווג הבטון לפי החוזק האופייני בלחיצה (מגפ"ס)

סוג הבטון	ב-15 ^(א)	ב-20	ב-25	ב-30	ב-40	ב-50	ב-60
חוזק אופייני בלחיצה, f_{ck}	15	20	25	30	40	50	60

טבלה 3.7 - ערכי חוזק התכן בלחיצה ובמתיחה צרית של בטון מזוין (מגפ"ס)

שורה	מצב גבולי	הסרחה	חוזק התכן ^(א)	סוג הבטון					
				ב-20	ב-25	ב-30	ב-40	ב-50	ב-60
1	הרס	לחיצה	$f_{cd} = \alpha_c (0.7 f_{ck}) / \gamma_c$	8.7	10.9	13.0	17.4	21.7	26.0
2	שירות	מתיחה צרית אופיינית	$f_{ctk} = 0.7 f_{ctm}$	1.2	1.4	1.6	1.9	2.2	2.5
3		מתיחה צרית ממוצעת	$f_{ctm} = 0.3 (0.7 f_{ck})^{2/3}$	1.7	2.0	2.3	2.8	3.2	3.6

טבלה 3.10 - ערכי חוזק התכן של פלדת זיון במתיחה ובלחיצה (מגפ"ס)

פרמטרים	סוגי מוטות הפלדה			
	מעובדים בחם		מעובדים בקר, לרשתות	
כינוי	פ-240	פ-400W	פ-500W	פ-500
סימול	ϕ	$\bar{\phi}_w$	$\bar{\Phi}_w$	חלקה $\bar{\Phi}$ מצולעת $\bar{\Phi}$
התקן הישראלי החל על המוט	ת"י 4466 חלק 2	ת"י 4466 חלק 3	ת"י 4466 חלק 3	ת"י 4466 חלק 4
חוזק אופייני, $f_{sk}^{(א)}$	± 240	± 400	± 500	± 500
חוזק התכן, $f_{sd}^{(א)(ב)}$	± 200	± 350	± 435	± 435

הערות לטבלה:
 (א) הסימן ± מתייחס הן לחוזק בלחיצה והן לחוזק במתיחה.
 (ב) רכיבי זיון המוטרחים בלחיצה (מוטות בודדים או רשתות) נמצאים בסכנת קריסה (בייחוד בניצב לפני הבטון הסמוכים), ולכן ניצולם במלוא חוזק התכן מותנה בהגנתם מפני סכנה זו.

טבלה 6.12 - הגבלת ערכי התמירות k_{12} לחתך מלבני מבטון ב-30^(6.1)

העומס המפורס F_{set} במצב גבולי של שירות (ק"נ למ"ר)														
3	5	10	15	20	25	35	50	100	150	200	300	400	500	700
36.4	30.7	24.4	21.3	19.3	18.0	16.1	14.3	11.3	9.9	9.0	7.8	7.2	6.6	5.9

טבלה 6.13 - היחס k_{13} בין התמירות בסוגי בטון שונים לתמירות של בטון ב-30

סוג הבטון	ב-20	ב-25	ב-30	ב-40	ב-50	ב-60
מאגראט גירי	0.97	0.99	1.00	1.02	1.05	1.07
מאגראט דולומיטי	1.01	1.02	1.04	1.07	1.09	1.11

טבלה 5.3 - מנת הזיון המינימלי לגזירה

סוג הבטון	מנת הזיון המינימלי לגזירה לפי סוגי זיון החישוקים		
	רשתות מרותכות ממוטות חלקים או ממוטות מצולעים, או מוטות מצולעים רתיכים	מוטות מצולעים רתיכים	מוטות חלקים
	$(f_{sk} = 500 \text{ MPa})$	$(f_{sk} = 400 \text{ מגפ"ס})$	$(f_{sk} = 240 \text{ מגפ"ס})$
ב-20	0.0010	0.0010	0.0016
ב-25	0.0010	0.0010	0.0017
ב-30	0.0010	0.0010	0.0019
ב-40	0.0010	0.0013	0.0022
ב-50	0.0010	0.0015	0.0025
ב-60	0.0013	0.0016	0.0027