

Таблица 5.7. Наибольшие прогибы и углы поворота

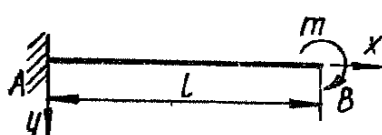
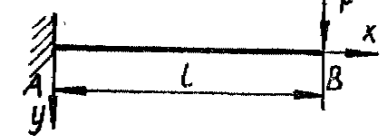
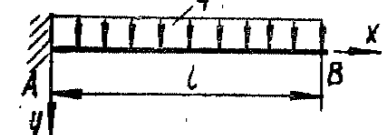
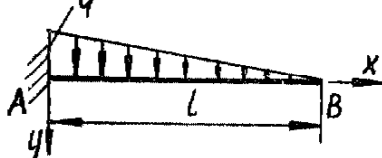
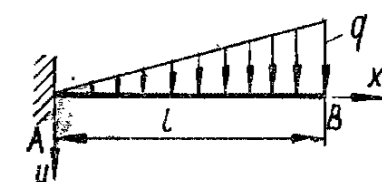
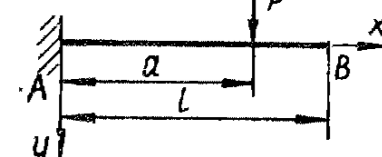
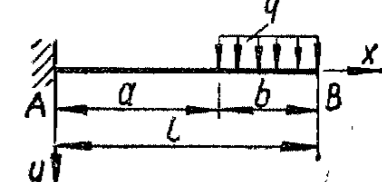
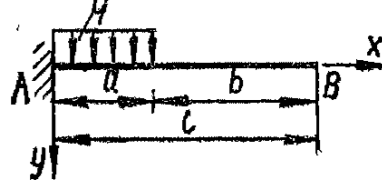
Схема балки и нагрузки	Прогиб	Угол поворота
	$f_B = \frac{ml^2}{2EJ}$	$\Theta_B = -\frac{ml}{EJ}$
	$f_B = \frac{Pl^3}{3EJ}$	$\Theta_B = -\frac{Pl^2}{2EJ}$
	$f_B = \frac{ql^4}{8EJ}$	$\Theta_B = -\frac{ql^3}{6EJ}$
	$f_B = \frac{ql^4}{30EJ}$	$\Theta_B = -\frac{ql^3}{24EJ}$
	$f_B = \frac{11}{120} \cdot \frac{ql^4}{EJ}$	$\Theta_B = -\frac{ql^3}{8EJ}$
	$f_B = \frac{Pa^2}{6EJ} (3l - a)$	$\Theta_B = -\frac{Pa^2}{2EJ}$
	$f_B = \frac{ql^4}{24EJ} \times$ $\times \left( 3 - 4 \frac{a^3}{l^3} + \frac{a^4}{l^4} \right)$	$\Theta_B = -\frac{ql^3}{6EJ} \left( 1 - \frac{a^3}{l^3} \right)$
	$f_B = \frac{qa^3}{24EJ} (4l - a)$	$\Theta_B = -\frac{qa^3}{6EJ}$

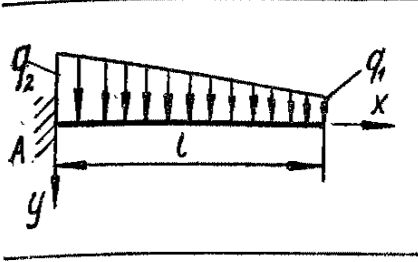
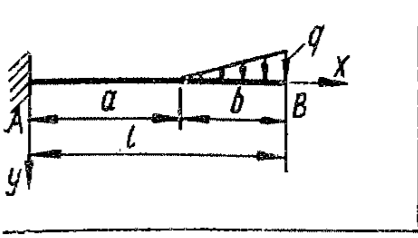
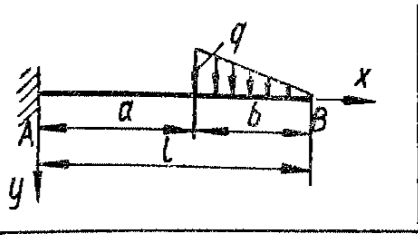
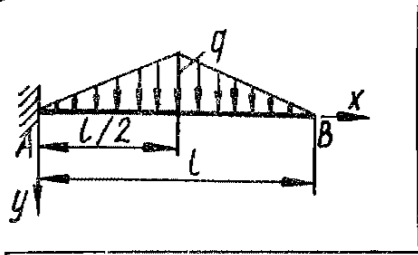
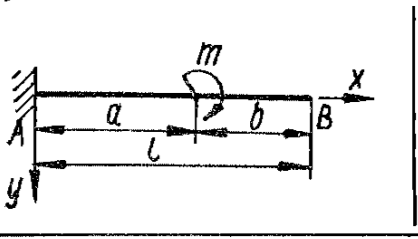
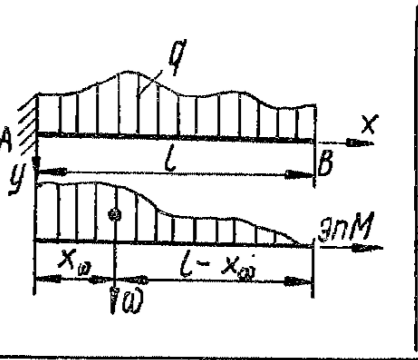
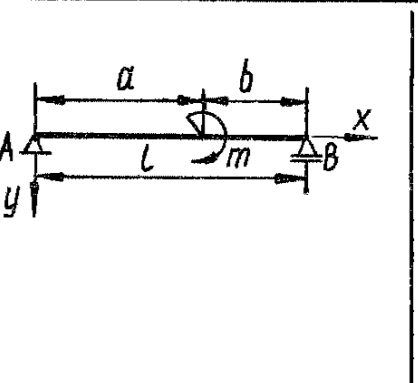
Схема балки и нагрузки	Прогиб	Угол поворота
	$f_B = \frac{l^4}{120EJ} (11q_1 + 4q_2)$	$\Theta_B = - \frac{3q_1 + q_2}{24EJ}$
	$f_B = \frac{ql^3b}{120EJ} \left( 20 - 10 \frac{b}{l} + \frac{b^3}{l^3} \right)$	$\Theta_B = - \frac{qb}{24EJ} (6l^2 - 4lb + b^2)$
	$f_B = \frac{ql^3b}{30EJ} \left( 5 - 5 \frac{b}{l} + \frac{b^3}{l^3} \right)$	$\Theta_B = - \frac{qb}{24EJ} (6l^2 - 8lb + 3b^2)$
	$f_B = \frac{11}{192} \cdot \frac{ql^4}{EJ}$	$\Theta_B = - \frac{7}{96} \cdot \frac{ql^3}{EJ}$
	$f_B = \frac{ma(l+b)}{2EJ}$	$\Theta_B = - \frac{ma}{EJ}$
	$f_B = \frac{\omega}{EJ} (l - x_\omega)$ <p><math>\omega</math> — площадь эюры <math>M</math>;  <math>x_\omega</math> — абсцисса центра тяжести площади эюры <math>M</math></p>	$\Theta_B = - \frac{\omega}{EJ}$
	<p>При <math>x = a</math></p> $f = \frac{mab}{3EJ} \left( \frac{a-b}{l} \right)$	$\Theta_A = - \frac{ml}{6EJ} \left( 1 - 3 \frac{b^2}{l^2} \right)$ $\Theta_B = \frac{ml}{6EJ} \left( 1 - 3 \frac{a^2}{l^2} \right)$

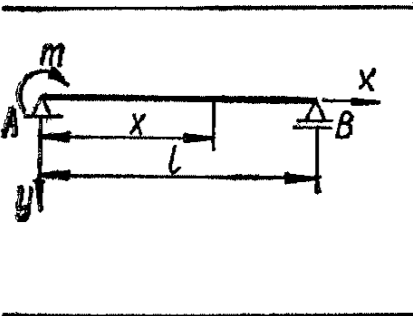
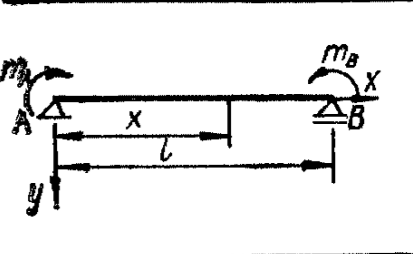
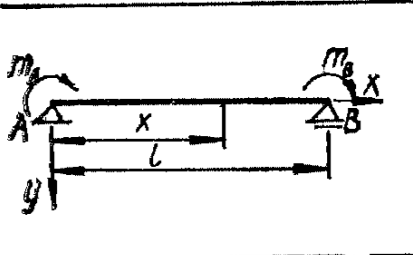
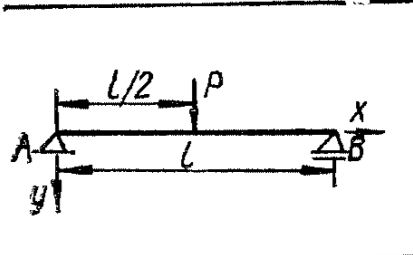
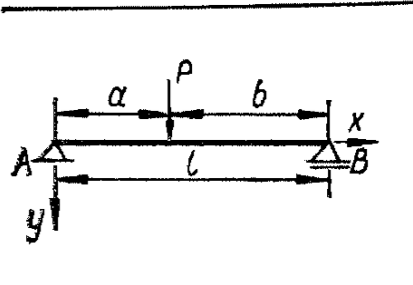
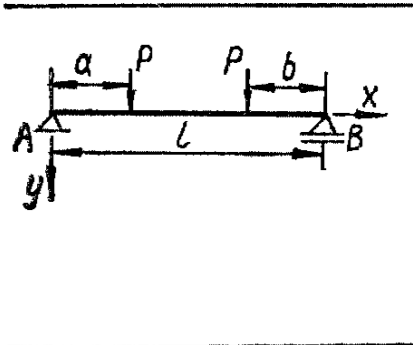
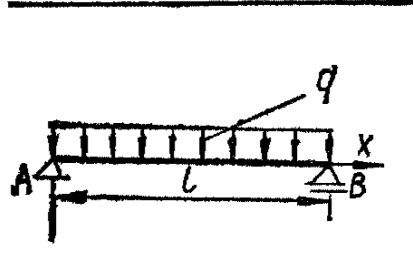
Схема балки и нагрузки	Прогиб	Угол поворота
	<p>При <math>x = 0,423l</math></p> $f = 0,0642 \frac{ml^2}{EJ}$ <p>При <math>x = \frac{l}{2}</math> <math>y = \frac{ml^2}{16EJ}</math></p>	$\Theta_A = \frac{ml}{3EJ}$ $\Theta_B = \frac{ml}{6EJ}$
	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{(m_A + m_B) l^2}{16EJ}$	$\Theta_A = \frac{m_A l}{3EJ} + \frac{m_B l}{6EJ}$ $\Theta_B = \frac{m_A l}{6EJ} + \frac{m_B l}{3EJ}$
	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{(m_A - m_B) l^2}{16EJ}$	$\Theta_A = \frac{m_A l}{3EJ} - \frac{m_B l}{6EJ}$ $\Theta_B = \frac{m_A l}{6EJ} - \frac{m_B l}{3EJ}$
	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{Pl^3}{48EJ}$	$\Theta_A = \Theta_B = \frac{Pl^2}{16EJ}$
	<p>При <math>x = a</math></p> $f = \frac{Pa^2b^2}{3EJl}$ <p>(см. также табл. 5.8)</p>	$\Theta_A = \frac{Pl^2}{6EJ} \left( \frac{b}{l} - \frac{b^3}{l^3} \right)$ $\Theta_B = \frac{Pl^2}{6EJ} \left( \frac{a}{l} - \frac{a^3}{l^3} \right)$
	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{Pl^3}{24EJ} \left( 3 \frac{a}{l} - 4 \frac{a^3}{l^3} \right)$	$\Theta_A = \Theta_B = \frac{Pa}{2EJ} (l - a)$
	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{5}{384} \cdot \frac{ql^4}{EJ}$	$\Theta_A = \Theta_B = \frac{ql^3}{24EJ}$

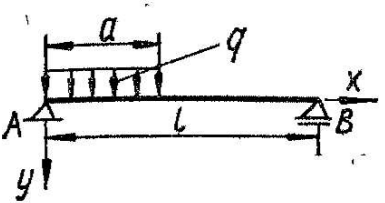
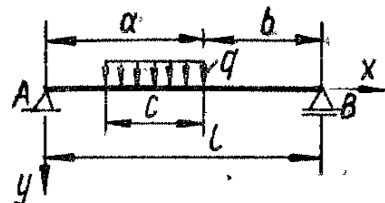
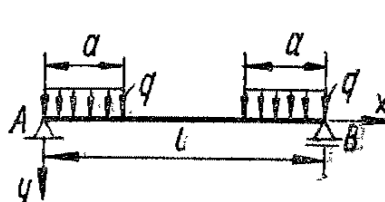
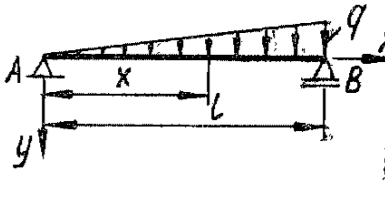
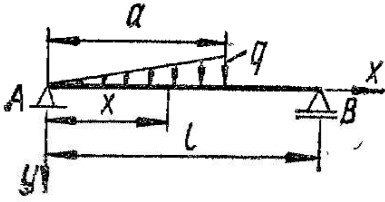
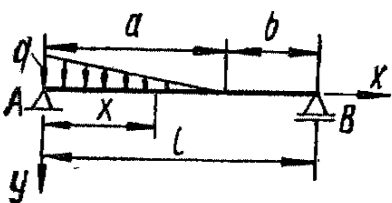
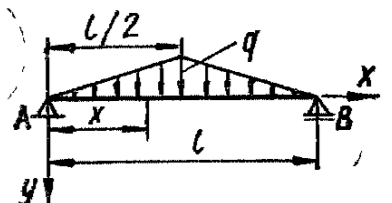
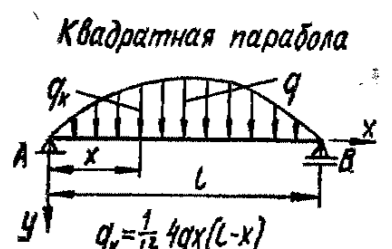
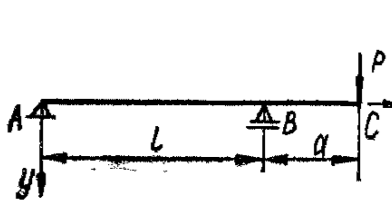
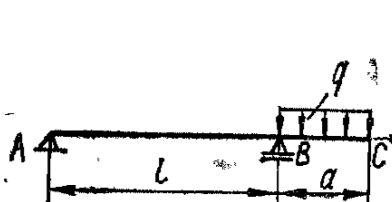
Схема балки и нагрузки	Прогиб	Угол поворота
	<p>При <math>x = a</math></p> $f = \frac{qa^3b}{24EJ} \left( 4 - 3 \frac{a}{l} \right)$ <p>Если <math>a &gt; 0,547l</math>  <math>y_{\text{макс}} = f</math> будет на левой стороне</p>	$\Theta_A = \frac{qa^2l}{6EJ} \left( 1 - \frac{a}{2l} \right)^2$ $\Theta_B = \frac{qa^2l}{12EJ} \left( 1 - \frac{a^2}{2l^2} \right)$
	<p>При <math>x = a</math></p> $f = \frac{qc}{6EJ} \left[ \frac{ab}{l} \left( 2al - \right. \right.$ $\left. \left. - 2a^2 - \frac{c}{4} \right) + \frac{c^3}{64} \right]$	$\Theta_A = \frac{qbc}{24EJl} [4a(l +$ $+ b) - c^2]$ $\Theta_B = \frac{qac}{24EJl} [4b(l +$ $+ a) - c^2]$
	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{ql^4}{48EJ} \cdot \frac{a^2}{l^2} \left( 3 - \right.$ $\left. - 2 \frac{a^2}{l^2} \right)$	$\Theta_A = \Theta_B =$ $= \frac{qa^2}{12EJ} (3l - 2a)$
	<p>При <math>x = 0,519l</math></p> $f = 0,00652 \frac{ql^4}{EJ}$	$\Theta_A = \frac{7}{360} \cdot \frac{ql^3}{EJ}$ $\Theta_B = \frac{8}{360} \cdot \frac{ql^3}{EJ}$
	<p>При <math>x = a</math></p> $f = \frac{qa^3l}{45EJ} \times$ $\times \left( 5 - 9 \frac{a}{l} + 4 \frac{a^2}{l^2} \right)$	$\Theta_A = \frac{qa^2l}{360EJ} \times$ $\times \left( 12 \frac{a^2}{l^2} - \right.$ $\left. - 45 \frac{a}{l} + 40 \right)$ $\Theta_B = \frac{qa^2l}{90EJ} \left( 5 - 3 \frac{a^2}{l^2} \right)$

Схема балки и нагрузки	Прогиб	Угол поворота
	<p>При <math>x = a</math></p> $f = \frac{qa^2bl}{360EJ} \times$ $\times \left( 20 \frac{a}{l} - 13 \frac{a^2}{l^2} \right)$	$\Theta_A = \frac{qa^2l}{360EJ} \times$ $\times \left( 3 \frac{a^2}{l^2} - \right.$ $\left. - 15 \frac{a}{l} + 20 \right)$ $\Theta_B = \frac{qal^2}{360EJ} \times$ $\times \left( 10 - 3 \frac{a^2}{l^2} \right)$
	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{ql^4}{120EJ}$	$\Theta_A = \Theta_B = \frac{5ql^3}{192EJ}$
<p>Квадратная парабола</p> 	<p>При <math>x = \frac{l}{2}</math></p> $f = \frac{61}{5760} \cdot \frac{ql^4}{EJ}$	$\Theta_A = \Theta_B = \frac{ql^3}{30EJ}$
	$y_c = \frac{Pa^2}{3EJ} (l + a);$ <p>при <math>x = 0,577l</math></p> $y_{\text{макс}} = f = -0,0642 \frac{Pal^2}{EJ}$	$\Theta_A = -\frac{Pal}{6EJ}$ $\Theta_B = -\frac{Pal}{3EJ}$ $\Theta_c = \frac{P}{6EJ} \times$ $\times (2la + 3a^2)$
	$y_c = \frac{qa^2}{24EJ} (4l + 3a);$ <p>при <math>x = 0,577l</math></p> $y_{\text{макс}} = f = -0,0321 \frac{qa^2l^2}{EJ}$	$\Theta_A = -\frac{qa^2l}{12EJ}$ $\Theta_B = -\frac{qa^2l}{6EJ}$ $\Theta_C = \frac{qa^2}{6EJ} (a + l)$