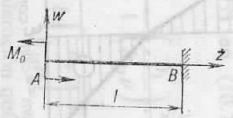
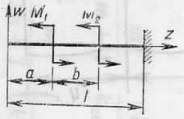
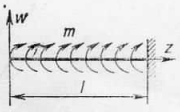
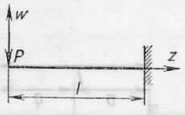
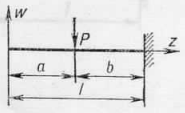
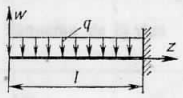
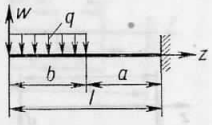
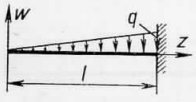
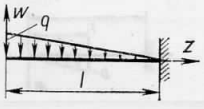
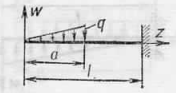
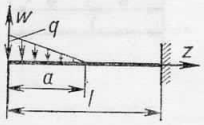
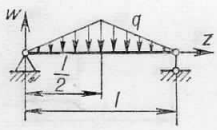
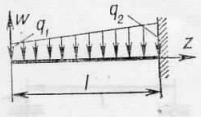
Ecuaciones de la línea elástica, flechas máximas y ángulos de giro de las secciones de extremo y de apoyo en las vigas isostáticas de sección transversal constante

Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant 1$ $w_z = -\frac{M_0 l^2}{2EJ}\left(1-\frac{z}{l}\right)^2$ $f = -\frac{M_0 l^2}{2EJ}$ para $z=0$	$\theta = \frac{M_0 l}{EJ}$ para $z = 0$
	$0 \leqslant z \leqslant a$ $w_z = -\frac{1}{2EJ}[(M_1+M_2)(1-z)^2 - M_1(a-z)^2 - M_2(a+b-z)^2]$ $a \leqslant z \leqslant a+b$ $w_z = -\frac{1}{2EJ}[(M_1+M_2)(l-z)^2 - M_2(a+b-z)^2]$ $a+b \leqslant z \leqslant l$ $w_z = -\frac{(M_1+M_2)l^2}{2EJ}\left(1-\frac{z}{l}\right)^2$ $f = -\frac{1}{2EJ}[(M_1+M_2)l^2 - M_1 a^2 - M_2(a+b)^2]$ para $z = 0$	$\theta = \frac{1}{EJ}[(M_1+M_2)l -$ $- M_1 a - M_2(a+b)]$ para $z = 0$
	$0 \leqslant z \leqslant l$ $w_z = \frac{ml^3}{6EJ}\left[2 - 3\frac{z}{l} + \left(\frac{z}{l}\right)^3\right]$ $f = \frac{ml^3}{3EJ}$ para $z = 0$	$\theta = -\frac{ml^2}{2EJ}$ para $z = 0$
	$0 \leqslant z \leqslant l$ $w_z = -\frac{Pl^3}{6EJ}\left[2 - 3\frac{z}{l} + \left(\frac{z}{l}\right)^3\right]$ $f = -\frac{Pl^3}{3EJ}$ para $z = 0$	$\theta = \frac{Pl^2}{2EJ}$ para $z = 0$
	$0 \leqslant z \leqslant a$ $w_z = \frac{Pb^3}{6EJ}\left(1 - 3\frac{z}{b}\right) = -\frac{Pb^3}{6EJ}\left(3\frac{a-z}{b} + 2\right)$ $a \leqslant z \leqslant l$ $w_z = \frac{Pb^3}{6EJ}\left(\frac{l-z}{b} - 3\right)\left(\frac{l-z}{b}\right)^2$ $f = \frac{Pb^3}{6EJ}\left(1 - 3\frac{l}{b}\right) = -\frac{Pb^3}{6EJ}\left(2 + 3\frac{a}{b}\right)$ para $z = 0$	$\theta = \frac{Pb^2}{2EJ}$ para $z = 0$

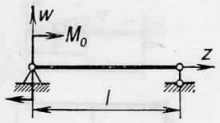
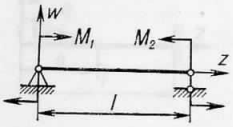
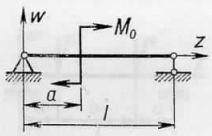
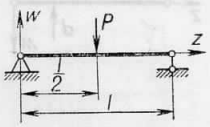
Continuación de la tabla 20

Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant l$ $w_z = -\frac{ql^4}{24EJ}\left[3 - 4\frac{z}{l} + \left(\frac{z}{l}\right)^4\right]$ $f = -\frac{ql^4}{8EJ}$ para $z = 0$	$\theta = \frac{ql^3}{6EJ}$ para $z = 0$
	$0 \leqslant z \leqslant b$ $w(z) = -\frac{ql^4}{24EJ}\left[3 - 4\frac{a^3}{l^3} + \frac{a^4}{l^4} - 4\left(1 - \frac{a^3}{l^3}\right)\frac{z}{l} + \frac{z^4}{l^4}\right]$ $b \leqslant z \leqslant l$ $w(z) = -\frac{ql^4}{24EJ}\left[3 - 4\frac{a^3}{l^3} + \frac{a^4}{l^4} - 4\left(1 - \frac{a^3}{l^3}\right)\frac{z}{l} + \frac{z^4}{l^4} - \frac{(z-b)^4}{l^4}\right]$ $f = -\frac{ql^4}{24EJ}\left(3 - 4\frac{a^3}{l^3} + \frac{a^4}{l^4}\right)$ para $z = 0$	$\theta = \frac{ql^3}{6EJ}\left(1 - \frac{a^3}{l^3}\right)$ para $z = 0$
	$0 \leqslant z \leqslant l$ $w_{(z)} = -\frac{ql^4}{120EJ}\left(4 - 5\frac{z}{l} + \frac{z^5}{l^5}\right)$ $f = -\frac{ql^4}{30EJ}$ para $z = 0$	$\theta = \frac{ql^3}{24EJ}$ para $z = 0$
	$0 \leqslant z \leqslant l$ $w_{(z)} = -\frac{ql^4}{120EJ}\left(11 - 15\frac{z}{l} + 5\frac{z^4}{l^4} - \frac{z^5}{l^5}\right)$ $f = -\frac{11}{120} \cdot \frac{ql^4}{EJ}$ para $z = 0$	$\theta = \frac{ql^3}{8EJ}$ para $z = 0$

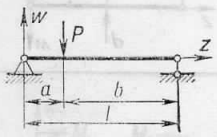
Continuación de la tabla 20

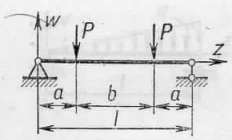
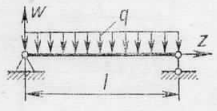
Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant a$ $w_{(z)} = -\frac{qal^3}{120EJ}\left[4\left(5 - 5\frac{a}{l} + \frac{a^3}{l^3}\right) - 5\left(6 - 8\frac{a}{l} + 3\frac{a^2}{l^2}\right)\frac{z}{l} + \frac{z^5}{a^2l^3}\right]$ $f = -\frac{qal^3}{30EJ}\left(5 - 5\frac{a}{l} + \frac{a^3}{l^3}\right)$ para $z = 0$	$\theta = \frac{qal^2}{24EJ}\left(6 - 8\frac{a}{l} + 3\frac{a^2}{l^2}\right)$ para $z = 0$
	$0 \leqslant z \leqslant a$ $w_{(z)} = -\frac{qal^3}{120EJ}\left[20 - 10\frac{a}{l} + \frac{a^3}{l^3} - 5\left(6 - 4\frac{a}{l} + \frac{a^2}{l^2}\right)\frac{z}{l} + 5\frac{z^4}{al^3} - \frac{z^5}{a^2l^3}\right]$ $f = -\frac{qal^3}{120EJ}\left(20 - 10\frac{a}{l} + \frac{a^3}{l^3}\right)$ para $z = 0$	$\theta = \frac{qal^2}{24EJ}\left(6 - 4\frac{a}{l} + \frac{a^2}{l^2}\right)$ para $z = 0$
	$0 \leqslant z \leqslant \frac{l}{2}$ $w(z) = -\frac{109ql^4}{1920EJ}\left[1 - \frac{140}{109}\cdot\frac{z}{l} + \frac{32}{109}\cdot\frac{z^5}{l^5}\right]$ $\frac{l}{2} \leqslant z \leqslant l$ $w(z) = -\frac{109ql^4}{1920EJ}\left[1 - \frac{140}{109}\cdot\frac{z}{l} + \frac{32}{109}\cdot\frac{z^5}{l^5} - \frac{64}{109}\cdot\frac{\left(z - \frac{l}{2}\right)^5}{l^5}\right]$ $f = -\frac{10{,}9ql^4}{192\,EJ}$ para $z = 0$	$\theta = \frac{7}{96}\cdot\frac{ql^3}{EJ}$ para $z = 0$
	$0 \leqslant z \leqslant l$ $w(z) = -\frac{l^4}{120EJ}\left[11q_1 + 4q_2 - 5(3q_1 + q_2)\frac{z}{l} + 5q_1\frac{z^4}{l^4} + (q_2 - q_1)\frac{z^5}{l^5}\right]$ $f = -\frac{11q_1 + 4q_2}{120EJ}l^4$ para $z = 0$	$\theta = \frac{3q_1 + q_2}{24EJ}l^3$ para $z = 0$

Continuación de la tabla 20

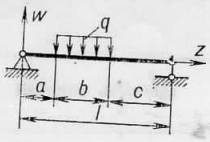
Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant l$ $w(z) = -\frac{M_0 l^2}{6EJ}\left(2\frac{z}{l} - 3\frac{z^2}{l^2} + \frac{z^3}{l^3}\right)$ $w = -\frac{M_0 l^2}{16EJ}$ para $z = \frac{l}{2}$ $f = -0{,}0642\frac{M_0 l^2}{EJ}$ para $z = 0{,}422\,l$	$\theta = -\frac{M_0 l}{3EJ}$ para $z = 0$ $\theta = \frac{M_0 l}{6EJ}$ para $z = l$
	$0 \leqslant z \leqslant l$ $w(z) = -\frac{l^2}{6EJ}\left[(2M_1 + M_2)\frac{z}{l} - 3M_1\frac{z^2}{l^2} + (M_1 - M_2)\frac{z^3}{l^3}\right]$ $w = -\frac{M_1 + M_2}{16EJ} l^2$ para $z = \frac{l}{2}$	$\theta = -\left(\frac{M_1 l}{3EJ} + \frac{M_2 l}{6EJ}\right)$ para $z = 0$ $\theta = \frac{M_1 l}{6EJ} + \frac{M_2 l}{3EJ}$ para $z = l$
	$0 \leqslant z \leqslant a$ $w(z) = \frac{M_0 l^2}{6EJ}\left[\left(6\frac{a}{l} - 3\frac{a^2}{l^2} - 2\right)\frac{z}{l} - \frac{z^3}{l^3}\right]$ $w = \frac{M_0 l^2}{6EJ}\left(3\frac{a^2}{l^2} - \frac{a}{l} - \frac{13}{8}\frac{a^3}{l^3}\right)$ para $z = \frac{a}{2}$ $w = \frac{M_0 l^2}{3EJ}\left(3\frac{a^2}{l^2} - \frac{a}{l} - 2\frac{a^3}{l^3}\right)$ para $z = a$	$\theta = -\frac{M_0 l}{6EJ}\left(2 - 6\frac{a}{l} + 3\frac{a^2}{l^2}\right)$ para $z = 0$ $\theta = -\frac{M_0 l}{EJ}\left(\frac{1}{3} - \frac{a}{l} + \frac{a^2}{l^2}\right)$ cuando $z = a$ $\theta = \frac{M_0 l}{6EJ}\left(1 - 3\frac{a^2}{l^2}\right)$ cuando $z = l$
	$0 \leqslant z \leqslant 1/2$ $w(z) = -\frac{Pl^3}{48EJ}\left(3\frac{z}{l} - 4\frac{z^3}{l^3}\right)$ $f = -\frac{Pl^3}{48EJ}$ para $z = \frac{l}{2}$	$\theta = -\frac{Pl^2}{16EJ}$ para $z = 0$ $\theta = \frac{Pl^2}{16EJ}$ para $z = l$

Continuación de la tabla 20

Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant a$ $w(z) = -\frac{Pa^2b^2}{6EJl}\left(2\frac{z}{a} + \frac{z}{b} - \frac{z^3}{a^2b}\right)$ $a \leqslant z \leqslant l$ $w(z) = -\frac{Pa^2b^2}{6EJl}\left[2\frac{l-z}{b} + \frac{l-z}{a} - \frac{(1-z)^3}{ab^2}\right]$ $w = -\frac{Pb}{48EJ}(3l^2 - 4b^2)$ para $z = \frac{l}{2}$ $w = -\frac{Pl^3}{3EJ}\left(\frac{ab}{l^2}\right)^2$ para $z = a$ $f = -\frac{Pbl^2\sqrt{3}}{27EJ}\sqrt{\left(1 - \frac{b^2}{l^2}\right)^3}$ para $z = \sqrt{\frac{l^2 - b^2}{3}}$	$\theta = -\frac{Pba}{6EJl}(a + 2b) =$ $= -\frac{Pl^2}{6EJ}\left(\frac{b}{l} - \frac{b^3}{l^3}\right)$ para $z = 0$ $\theta = \frac{Pa}{6EJl}(l^2 - a^2)$ para $z = l$

	$0 \leqslant z \leqslant a$ $w(z) = -\frac{Pa^3}{6EJ}\left[3\left(1 + \frac{b}{a}\right)\frac{z}{a} - \frac{z^3}{a^3}\right]$ $a \leqslant z \leqslant a + b$ $w(z) = -\frac{Pa^3}{6EJ}\left[3\left(1 + \frac{b}{a}\right)\frac{z}{a} - \frac{z^3}{a^3} + \frac{(z-a)^3}{a^3}\right]$ $w = -\frac{Pa^3}{6EJ}\left(2 + 3\frac{b}{a}\right)$ para $z = a$ $f = -\frac{Pl^2}{24EJ}\left(3\frac{a}{l} - 4\frac{a^3}{l^3}\right)$ para $z = \frac{l}{2}$	$\theta = -\frac{Pa(a+b)}{2EJ}$ para $z = 0$ $\theta = \frac{Pa(a+b)}{2EJ}$ para $z = l$ si $a = l/3$ $f = \frac{23}{648}\frac{Pl^3}{EJ}$
	$0 \leqslant z \leqslant l$ $w(z) = -\frac{ql^4}{24EJ}\left[\frac{z}{l} - 2\left(\frac{z}{l}\right)^3 + \left(\frac{z}{l}\right)^4\right]$ $f = -\frac{5ql^4}{384\,EJ}$ para $z = \frac{l}{2}$	$\theta = -\frac{ql^3}{24EJ}$ para $z = 0$ $\theta = \frac{ql^3}{24EJ}$ para $z = l$

Ángulo de giro θ



$$0 \leqslant z \leqslant a$$

$$w(z) = -\frac{qbl^3}{48EJ}\left[8\frac{d}{l}\left(\frac{z}{l}-\frac{z^3}{l^3}\right)-\frac{z}{l}\left(8\frac{d^3}{l^3}-\frac{2ab^2}{l^3}-\frac{b^3}{l^3}+2\frac{b^2}{l^2}\right)\right]$$

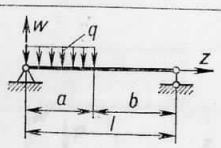
$$a \leqslant z \leqslant a+b$$

$$w(z) = -\frac{qbl^3}{48EJ}\left[8\frac{d}{l}\left(\frac{z}{l}-\frac{z^3}{l^3}\right)-\frac{z}{l}\left(8\frac{d^3}{l^3}-2\frac{ab^2}{l^3}-\frac{b^3}{l^3}+2\frac{b^2}{l^2}\right)+2\frac{(z-a)^4}{bl^3}\right]$$

$$\theta = -\frac{qbl^2}{24EJ}\left(4\frac{d}{l}-4\frac{d^3}{l^3}+\frac{ab^2}{l^3}+\frac{1}{2}\cdot\frac{b^3}{l^3}-\frac{b^2}{l^2}\right)$$

para $z = 0$

$$d = c + \frac{1}{2}b$$



$$0 \leqslant z \leqslant a$$

$$w(z) = -\frac{qa^3l}{24EJ}\left[4\left(1-\frac{a}{2l}\right)^2\frac{z}{a}-4\frac{\left(\frac{a}{2}+b\right)z^3}{a^2l^2}+\frac{z^4}{a^3l}\right]$$

$$a \leqslant z \leqslant l$$

$$w(z) = -\frac{qa^3l}{24EJ}\left[4\left(1-\frac{a}{2l}\right)^2\frac{z}{a}-4\frac{\left(\frac{a}{2}+b\right)z^3}{a^2l^2}+\frac{z^4}{a^3l}-\frac{(z-a)^4}{a^3l}\right]$$

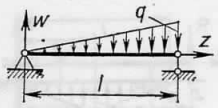
$$w = -\frac{qa^3l}{24EJ}\left(4-7\frac{a}{l}+3\frac{a^2}{l^2}\right) \text{ para } z = a$$

$$\theta = -\frac{qa^2l}{6EJ}\left(1-\frac{a}{2l}\right)^2$$

para $z = 0$

$$\theta = \frac{qa^2l}{12EJ}\left(1-\frac{a^2}{2l^2}\right)$$

para $z = l$



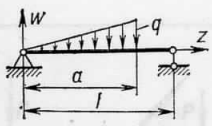
$$0 \leqslant z \leqslant l$$

$$w(z) = -\frac{ql^4}{360EJ}\left(7\frac{z}{l}-10\frac{z^3}{l^3}+3\frac{z^5}{l^5}\right)$$

$$f = -0{,}00652\frac{ql^4}{EJ} \text{ para } z = 0{,}5193l$$

$$\theta = -\frac{7ql^3}{360EJ} \text{ para } z = 0$$

$$\theta = \frac{8ql^3}{360EJ} \text{ para } z = l$$



$$0 \leqslant z \leqslant a$$

$$w(z) = -\frac{qa^3l}{360EJ}\left[\left(40-45\frac{a}{l}+12\frac{a^2}{l^2}\right)\frac{z}{a}-10\left(3-2\frac{a}{l}\right)\frac{z^3}{a^2l}+3\frac{z^5}{a^4l}\right]$$

$$a \leqslant z \leqslant l$$

$$w(z) = -\frac{qa^3l}{90EJ}\left[\left(5-3\frac{a^2}{l^2}\right)\frac{l-z}{a}-5\frac{(l-z)^3}{al^2}\right]$$

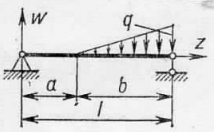
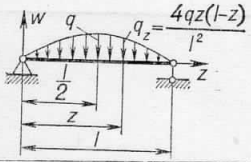
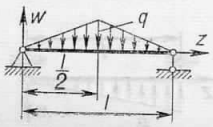
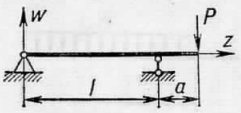
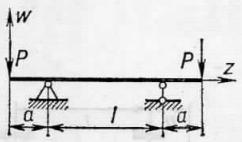
$$w = -\frac{qa^3l}{}\left(5-9\frac{a}{}+4\frac{a^2}{}\right) \text{ para } z = a$$

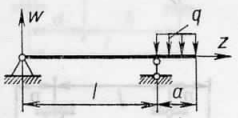
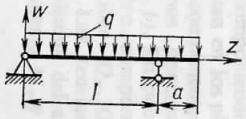
$$\theta = -\frac{qa^2l}{360EJ}\left(40-45\frac{a}{l}+12\frac{a^2}{l^2}\right)$$

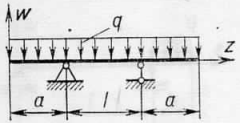
para $z = 0$

$$\theta = \frac{qa^2l}{90EJ}\left(5-3\frac{a^2}{l^2}\right) \text{ para } z = l$$

Continuación de la tabla 20

Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant a$ $w(z) = -\frac{qab^2l}{360EJ}\left[\left(10 - 3\frac{b^2}{l^2}\right)\frac{z}{a} - 10\frac{z^3}{al^2}\right]$ $a \leqslant z \leqslant l$ $w(z) = -\frac{qab^2l}{360EJ}\left[\left(10 - 3\frac{b^2}{l^2}\right)\frac{z}{a} - 10\frac{z^3}{al^2} + 3\frac{(z-a)^5}{b^3al}\right]$ $w = -\frac{qab^2l}{360EJ}\left(20\frac{b}{l} - 13\frac{b^2}{l^2}\right)$ para $z = a$	$\theta = -\frac{qb^2l}{360EJ}\left(10 - 3\frac{b^2}{l^2}\right)$ para $z = 0$ $\theta = \frac{qb^2l}{360EJ}\left(20 - 15\frac{b}{l} + 3\frac{b^2}{l^2}\right)$ para $z = l$
	$f = -\frac{61}{5760}\cdot\frac{ql^4}{EJ}$ para $z = \frac{l}{2}$	$\theta = -\frac{ql^3}{30EJ}$ para $z = 0$ $\theta = \frac{ql^3}{30EJ}$ para $z = l$
	$0 \leqslant z \leqslant l/2$ $w(z) = -\frac{ql^4}{24EJ}\left(\frac{5}{8}\cdot\frac{z}{l} - \frac{z^3}{l^3} + \frac{2}{5}\cdot\frac{z^5}{l^5}\right)$ $f = -\frac{ql^4}{120EJ}$ para $z = \frac{l}{2}$	$\theta = -\frac{5}{192}\cdot\frac{ql^3}{EJ}$ para $z = 0$ $\theta = \frac{5}{192}\cdot\frac{ql^3}{EJ}$ para $z = l$
	$0 \leqslant z \leqslant l$ $w(z) = \frac{Pal^2}{6EJ}\left(\frac{z}{l} - \frac{z^3}{l^3}\right)$ $l \leqslant z \leqslant l + a$ $w(z) = \frac{Pal^2}{6EJ}\left[\frac{z}{l} - \frac{z^3}{l^3} + \frac{(l+a)(z-l)^3}{al^3}\right]$ $w_{\text{máx}} = 0{,}0642\frac{Pal^2}{EJ}$ para $z = 0{,}578l$ $w = -\frac{Pa^2}{3EJ}(l + a)$ para $z = l + a$	$\theta = \frac{Pal}{6EJ}$ para $z=0$ $\theta = -\frac{Pal}{3EJ}$ para $z=l$ $\theta = -\frac{Pa}{6EJ}(2l + 3a)$ para $z = l + a$
	$0 \leqslant z \leqslant a$ $w(z) = -\frac{Pa^2}{6EJ}\left[(3l + 2a) - 3(l + a)\frac{z}{a} + \frac{z^3}{a^2}\right]$ $a \leqslant z \leqslant l$ $w(z) = -\frac{Pa^2}{6EJ}\left[(3l + 2a) - 3(l + a)\frac{z}{a} + \frac{z^3}{a^2} - \frac{(z-a)^3}{a^2}\right]$ $w = -\frac{Pa^2}{6EJ}(3l + 2a)$ para $z = 0$ y $z = l + 2a$ $f = \frac{Pal^2}{8EJ}$ para $z = a + \frac{l}{2}$	$\theta = \frac{Pal}{2EJ}$ para $z=a$ $\theta = -\frac{Pal}{2EJ}$ para $z=a+l$ $\theta = \frac{Pa(a+l)}{2EJ}$ para $z=0$ $\theta = -\frac{Pa(a+l)}{2EJ}$ para $z = 2a + l$

Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant l$ $w(z) = \frac{qa^2l^2}{12EJ}\left(\frac{z}{l} - \frac{z^3}{l^3}\right)$ $l \leqslant z \leqslant l + a$ $w(z) = -\frac{qa^3l}{24EJ}\left[\left(4 + 3\frac{a}{l}\right) - 4\left(1 + \right.\right.$ $\left.\left. + \frac{l}{a}\right)\left(1 + \frac{a}{l} - \frac{z}{l}\right) + \frac{l^3}{a^3}\left(1 + \frac{a}{l} - \frac{z}{l}\right)^4\right]$ $w = \frac{qa^2l^2}{32EJ}$ para $z = \frac{l}{2}$ $w_{máx} = 0{,}0321\frac{qa^2l^2}{EJ}$ para $z = 0{,}577l$ $w = -\frac{qa^3}{24EJ}(4l + 3a)$ para $z = l + a$	$\theta = \frac{qa^2l}{12EJ}$ para $z = 0$ $\theta = -\frac{qa^2l}{6EJ}$ para $z = l$ $\theta = -\frac{qa^2}{6EJ}(a + l)$ para $z = l + a$
	$0 \leqslant z \leqslant l$ $w(z) = -\frac{ql^4}{24EJ}\left[\left(1 - 2\frac{a^2}{l^2}\right)\frac{z}{l} - 2\left(1 - \right.\right.$ $\left.\left. - \frac{a^2}{l^2}\right)\frac{z^3}{l^3} + \frac{z^4}{l^4}\right]$ $l \leqslant z \leqslant l + a$ $w(z) = -\frac{ql^4}{24EJ}\left[\left(4\frac{a^3}{l^3} - \frac{a}{l} + 3\frac{a^4}{l^4}\right) - \right.$ $\left. - \left(4\frac{a^2}{l^2} - 1 + 4\frac{a^3}{l^3}\right)\left(1 + \frac{a}{l} - \frac{z}{l}\right) + \right.$ $\left. + \left(1 + \frac{a}{l} - \frac{z}{l}\right)^4\right]$ $w = -\frac{ql^4}{384EJ}\left(5 - 12\frac{a^2}{l^2}\right)$ para $z = \frac{l}{2}$ $w = -\frac{qa^4}{24EJ}\left(3 + 4\frac{l}{a} - \frac{l^3}{a^3}\right)$ para $z = l + a$	$\theta = -\frac{ql^3}{24EJ}\left(1 - 2\frac{a^2}{l^2}\right)$ para $z = 0$ $\theta = \frac{ql^3}{24EJ}\left(1 + \frac{a^2}{l^2}\right)$ para $z = l$ $\theta = -\frac{ql^3}{24EJ}\left(4\frac{a^3}{l^3} + 4\frac{a^2}{l^2} - 1\right)$ para $z = l + a$

Esquema de la viga	Ecuación de la línea elástica $w(z)$ y la flecha máxima f	Angulo de giro θ
	$0 \leqslant z \leqslant a$ $w(z) = \frac{ql^4}{24EJ}\left[\left(1 - 6\frac{a^2}{l^2} - 3\frac{a^3}{l^3}\right)\frac{a}{l} - \left(1 - 6\frac{a^2}{l^2} - 4\frac{a^3}{l^3}\right)\frac{z}{l} - \frac{z^4}{l^4}\right]$ $a \leqslant z \leqslant a + l$ $w(z) = \frac{ql^4}{24EJ}\left[\left(1 - 6\frac{a^2}{l^2} - 3\frac{a^3}{l^3}\right)\frac{a}{l} - \left(1 - 6\frac{a^2}{l^2} - 4\frac{a^3}{l^3}\right)\frac{z}{l} + 2\left(1 + 2\frac{a}{l}\right)\frac{(z-a)^3}{l^3} - \frac{z^4}{l^4}\right]$ $w = \frac{qal^3}{24EJ}\left(1 - 6\frac{a^2}{l^2} - 3\frac{a^3}{l^3}\right)$ para $z = 0$ y $z = l + 2a$ $w = -\frac{ql^4}{16EJ}\left(\frac{5}{24} - \frac{a^2}{l^2}\right)$ para $z = a + \frac{l}{2}$	$\theta = -\frac{ql^3}{24EJ}\left(1 - 6\frac{a^2}{l^2} - 4\frac{a^3}{l^3}\right)$ para $z = 0$ $\theta = -\frac{ql^3}{4EJ}\left(\frac{1}{6} - \frac{a^2}{l^2}\right)$ para $z = a$ $\theta = \frac{ql^3}{4EJ}\left(\frac{1}{6} - \frac{a^2}{l^2}\right)$ para $z = a + l$ $\theta = \frac{ql^3}{24EJ}\left(1 - 6\frac{a^2}{l^2} - 4\frac{a^3}{l^3}\right)$ para $z = l + 2a$