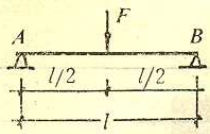
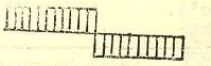
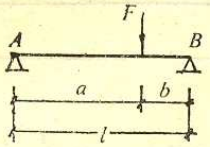
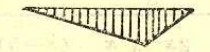
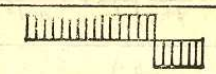
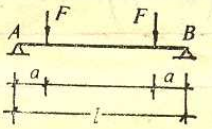
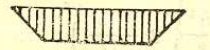
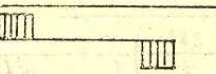
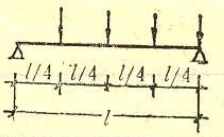
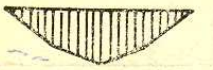
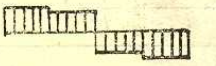
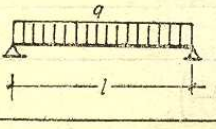
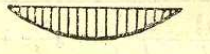
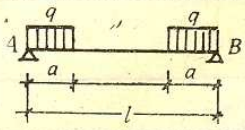
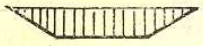
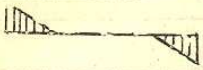
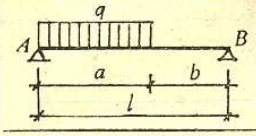
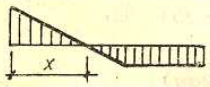
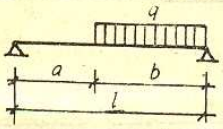
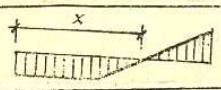
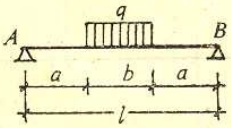
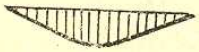
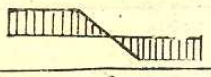
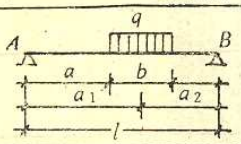
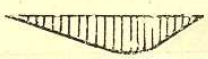
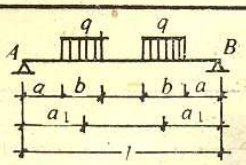
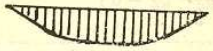
各类梁反力、剪力、弯矩和挠度计算公式一览表

简支梁的反力、剪力、弯矩、挠度　　表 15-4-15

序次	图类	图示	项目	计算式
1	荷载		反力	$R_A = R_B = \frac{F}{2}$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{1}{4}Fl$
	剪力		挠度	$W_{max} = \frac{Fl^3}{48EI}$
2	荷载		反力	$R_A = \frac{b}{l}F;\quad R_B = \frac{a}{l}F$
			剪力	$V_A = R_A;\ V_B = -R_B$
			弯矩	$M_{max} = \frac{Fab}{l}$
	弯矩		挠度	若$a>b$时，在$x=\sqrt{\frac{a}{3}(a+2b)}$处， $W_{max} = \frac{Fb}{9EIl}\sqrt{\frac{(a^2+2ab)^3}{3}}$
	剪力			
3	荷载		反力	$R_A = R_B = F$
			剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = Fa$
	剪力		挠度	$W_{max} = \frac{Fa}{24EI}(3l^2 - 4a^2)$
4	荷载		反力	$R_A = R_B = \frac{3}{2}F$
			剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{1}{2}Fl$
	剪力		挠度	$W_{max} = \frac{19Fl^3}{384EI}$
5	荷载		反力	$R_A = R_B = \frac{1}{2}ql$
			剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{1}{8}ql^2$
	剪力		挠度	$W_{max} = \frac{5ql^4}{384EI}$

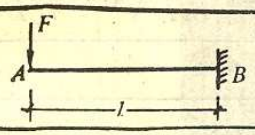
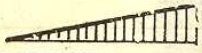
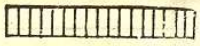
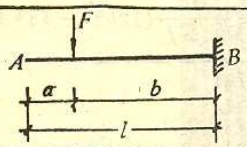
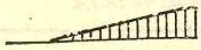
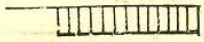
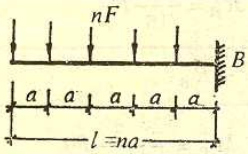
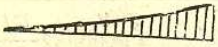
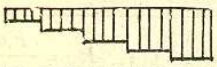
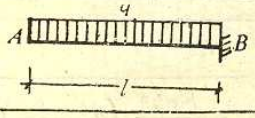
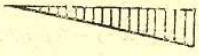
序次	图类	图示	项目	计算式
6	荷载		反力	$R_A = R_B = qa$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{1}{2}qa^2$
	剪力		挠度	$W_{max} = \frac{qa^2}{48EI}(3l^2 - 2a^2)$
7	荷载		反力	$R_A = \frac{qa}{2}\left(2 - \frac{a}{l}\right);\quad R_B = \frac{qa^2}{2l}$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	当 $x = a - \frac{a^2}{2L}$ 时， $M_{max} = \frac{qa^2}{8l}\left(4b + \frac{a^2}{l}\right) = \frac{qa^2}{8}\left(2 - \frac{a}{l}\right)^2$
	剪力		挠度	$W_{max} = \frac{qa^2l^2}{24EI}\left[\left(2 - \frac{a^2}{l^2} - \frac{2x^2}{l^2}\right)\frac{x}{l} + \frac{(x-b)^4}{a^2l^2}\right]$
8	荷载		反力	$R_A = \frac{qb^2}{2l};\quad R_B = \frac{qb}{2}\left(2 - \frac{b}{l}\right)$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	当 $x = a + \frac{b^2}{2l}$ 时； $M_{max} = \frac{qb^2}{8l}\left(4a + \frac{b^2}{l}\right) = \frac{qb^2}{8}\left(2 - \frac{b}{l}\right)^2$
	剪力		挠度	$W_{max} = \frac{qb^2l^2}{24EI}\left[\left(2 - \frac{b^2}{l^2} - \frac{2x^2}{l^2}\right)\frac{x}{l} + \frac{(x-a)^4}{b^2l^2}\right]$
9	荷载		反力	$R_A = R_B = \frac{qb}{2}$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{qbl}{8}\left(2 - \frac{b}{l}\right)$
	剪力		挠度	$W_{max} = \frac{qbl^3}{384EI}\left(8 - \frac{4b^2}{l^2} + \frac{b^3}{l^3}\right)$
10	荷载		反力	$R_A = \frac{qa_2b}{l};\quad R_B = \frac{qa_1b}{l}$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{qba_2}{l}\left(a + \frac{ba_2}{2l}\right)$
	剪力		挠度	$W_{max} = \frac{qba_2}{24EI}\left[\left(4l - 4\frac{a_2^2}{l} - \frac{b^2}{l}\right)x - 4\frac{x^3}{l} + \frac{(x-a)^4}{6a^3}\right]$ 式中：$x = a + \frac{ba_2}{l}$

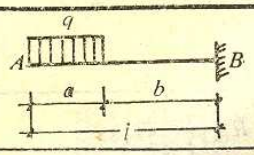
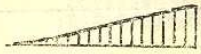
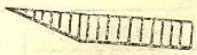
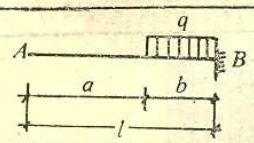
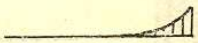
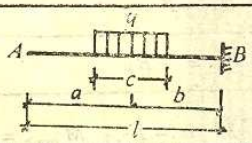
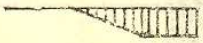
序次	图类	图示	项目	计算式
11	荷载		反力	$R_A = R_B = qb$
			剪力	$V_A = R_A$；$V_B = -R_B$
	弯矩		弯矩	$M_{max} = qba_1$
	剪力		挠度	$W_{max} = \frac{qba_1}{2EI}\left(\frac{l^2}{4} - \frac{a_1^2}{3} - \frac{b^2}{12}\right)$

2.悬臂梁

悬臂梁的反力、剪力、弯矩和挠度

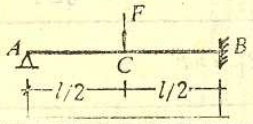
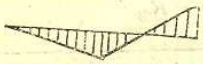
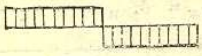
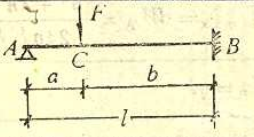
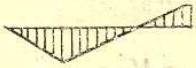
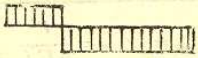
附表 15-4-16

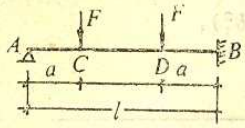
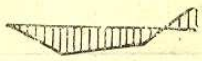
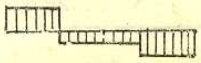
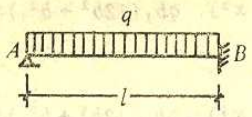
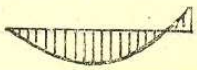
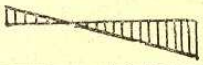
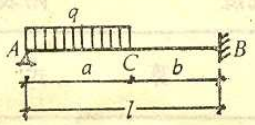
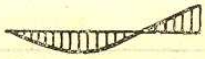
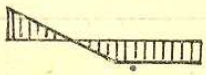
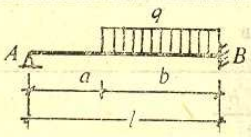
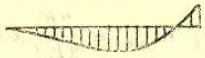
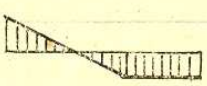
序次	图类	图示	项目	计算式
1	荷载		反力	$R_B = F$
			剪力	$V_B = -R_B$
	弯矩		弯矩	$M_x = -F_x$；$M_{max} = M_B = -Fl$
	剪力		挠度	$W_{max} = W_A = \frac{Fl^3}{3EI}$
2	荷载		反力	$R_B = F$
			剪力	$V_B = -R_B$
	弯矩		弯矩	$M_x = -F(x-a)$；$M_{max} = M_B = -Fb$
	剪力		挠度	$W_{max} = W_A = \frac{Fb^2l}{6EI}\left(3 - \frac{b}{l}\right)$
3	荷载		反力	$R_B = nF$
			剪力	$V_B = -R_B$
	弯矩		弯矩	$M_{max} = M_B = -\frac{n+1}{2}Fl$
	剪力		挠度	$W_{max} = W_A = \frac{3n^2+4n+1}{24nEI}Fl^3$
4	荷载		反力	$R_B = ql$
			剪力	$V_B = -R_B$
	弯矩		弯矩	$M_{max} = M_B = -\frac{ql^2}{2}$
	剪力		挠度	$W_{max} = W_A = \frac{ql^4}{8EI}$

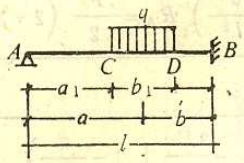
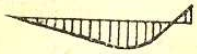
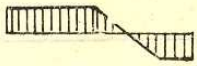
序次	图类	图示	项目	计算式
5	荷载		反力	$R_B = qa$
			剪力	$V_B = -R_B$
	弯矩		弯矩	$M_{max} = M_B = -\frac{qal}{2}(2-a)$
	剪力		挠度	$W_{max} = W_A = \frac{ql^4}{24EI}\left(3-4\frac{b^3}{l^3}+\frac{b^4}{l^4}\right)$
6	荷载		反力	$R_B = qb$
			剪力	$V_B = -R_B$
	弯矩		弯矩	$M_B = -\frac{qb^2}{2}$
	剪力		挠度	$W_A = \frac{qb^2l}{24EI}\left(4-\frac{b}{l}\right)$
7	荷载		反力	$R_B = qc$
			剪力	$V_B = -R_B$
	弯矩		弯矩	$M_B = -qcb$
	剪力		挠度	$W_A = \frac{qc}{24EI}(12b^2l-4b^3+ac^2)$

3.一端简支另一端固定梁

一端简支另一端固定梁的反力、剪力、弯矩和挠度 附表 15-4-17

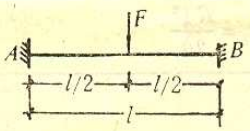
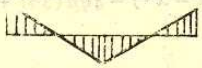
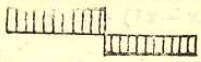
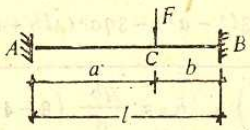
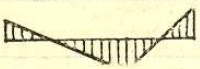
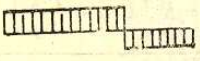
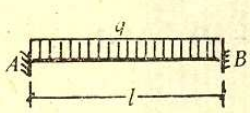
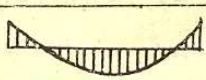
序次	图类	图示	项目	计算式
1	荷载		反力	$R_A = \frac{5}{16}F$；$R_B = \frac{11}{16}F$
			剪力	$V_A = R_A$；$V_B = -R_B$
	弯矩		弯矩	$M_c = \frac{5}{32}Fl$；$M_B = -\frac{3}{16}Fl$
	剪力		挠度	当$x = 0.447l$时：$W_{max} = 0.00932\frac{Fl^3}{EI}$
2	荷载		反力	$R_A = \frac{Fb^2}{2l^2}\left(3-\frac{b}{l}\right)$；$R_B = \frac{Fa}{2l}\left(3-\frac{a^2}{l^2}\right)$
			剪力	$V_A = R_A$；$V_B = -R_B$
	弯矩		弯矩	当$x = a$时，$M_{max} = \frac{Fab^2}{2l^2}\left(3-\frac{b}{l}\right)$
	剪力		挠度	CB段： $W_x = \frac{1}{6EI}[R_A(3l^2x-x^3)-3Fb^2x+F(x-a)^2]$

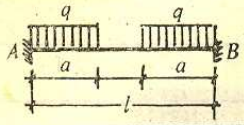
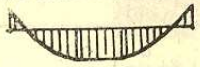
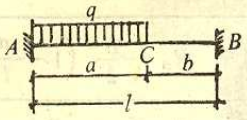
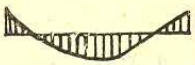
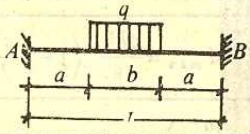
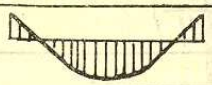
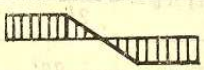
序次	图类	图示	项目	计算式
3	荷载		反力	$R_A=\frac{F}{2}\left(2-3\frac{a}{l}+3\frac{a^2}{l^2}\right)$，$R_A=\frac{F}{2}\left(2+3\frac{a}{l}-3\frac{a^2}{l^2}\right)$
	剪力		剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	$M_{max}=M_C=R_Aa$；$M_B=-\frac{3Fa}{2}\left(1-\frac{a}{l}\right)$
	剪力		挠度	CD段： $W_x=\frac{1}{6EI}[R_A(3l^2x-x^3)-3F(l^2-2al+2a^2)x+F(x-a)^3]$
4	荷载		反力	$R_A=\frac{3}{8}ql$；$R_B=\frac{5}{8}ql$
	剪力		剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	当$x=\frac{3}{8}l$时，$M_{max}=\frac{9ql^4}{128}$
	剪力		挠度	当$x=0.422l$时，$W_{max}=0.00542\frac{ql^4}{EI}$
5	荷载		反力	$R_A=\frac{qa}{8}(8-ba+a^3)$；$R_B=\frac{qa^2}{8l}(bl-a^2)$
	剪力		剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	当$x=\frac{R_A}{q}$时，$M_{max}=\frac{R_A^2}{2q}$
	剪力		挠度	AC段： $W_x=\frac{1}{24EI}[4R_A(3l^2x-x^3)-4qa(3bl+a^2)x+qx^4]$ BC段： $W_x=\frac{1}{24EI}[4R_A(3l^2x-x^3)-qa(a^3+12blx+bax^2-4x^3]$ 当$x=a$时， $W_a=\frac{1}{24EI}[4aR_A(3l^2-a^2)-3qa^2(4lb+a^2)]$
6	荷载		反力	$R_A=\frac{qb^3}{8l^3}\left(4-\frac{b}{l}\right)$；$R_B=\frac{qb}{8}\left(8-4\frac{b^2}{l^2}+\frac{b^3}{l^3}\right)$
	剪力		剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	当$x=a+\frac{R_A}{q}$时，$M_{max}=R_A\left(a+\frac{R_A}{2q}\right)$
	剪力		挠度	AC段： $W_x=\frac{1}{6EI}[R_A(3l^2x-x^3)-qb^3x]$ BC段： $W_x=\frac{1}{24EI}[4R_A(3l^2x-x^3)-4qb^3x+q(x-a)^4]$ 当$x=a$时： $W_a=\frac{1}{6EI}[aR_A(3l^2-a^2)-qb^3]$

序次	图类	图　　示	项目	计　　算　　式
7	荷载		反力	$R_A=\frac{qb_1}{8l^3}(12b^2l-4b^3+ab_1^2)$； $R_B=qb_1-R_A$
			剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	当$x=a_1+\frac{R_A}{q}$时：$M_{max}=R_A\left(a_1+\frac{R_A}{2q}\right)$
	剪力		挠度	AC段： $W_x=\frac{1}{24EI}[4R_A(3l^2x-x^3)\quad qb_1(12b^2+b_1^2)x]$ CD段： $W_x=\frac{1}{24EI}[4R_A(3l^2x-x^3)-qb_1(12b^2+b_1^2)x+q(x-a_1)^4]$

4.两端固定梁

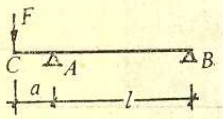
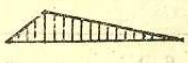
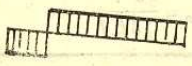
两端固定梁的反力、剪力、弯矩和挠度　　附表 15-4-18

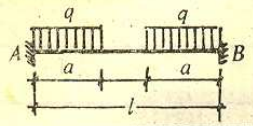
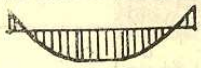
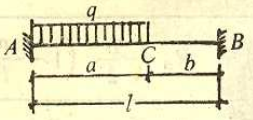
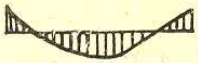
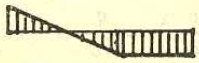
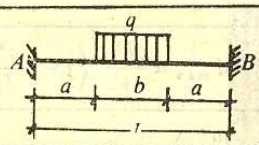
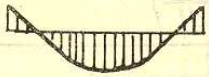
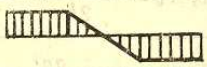
序次	图类	图.　　示	项目	计　　算　　式
1	荷载		反力	$R_A=R_B=\frac{1}{2}F$
			剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	$M_{max}=\frac{1}{8}Fl$
	剪力		挠度	$W_{max}=\frac{Fl^3}{192EJ}$
2	荷载		反力	$R_A=\frac{Fb^2}{l^2}\left(1+\frac{2a}{l}\right)$，　$R_B=\frac{Fa^2}{l^2}\left(1+\frac{2b}{l}\right)$
			剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	$M_{max}=M_C=\frac{2Fa^2b^2}{l^3}$
	剪力		挠度	若$a>b$，　当$x=\frac{2al}{3a+b}$时：$W_{max}=\frac{2F}{3EJ}\times\frac{a^2b^2}{(3a+b)^2}$
3	荷载		反力	$R_A=R_B=\frac{ql}{2}$
			剪力	$V_A=R_A$；$V_B=-R_B$
	弯矩		弯矩	$M_{max}=\frac{ql^2}{24}$
	剪力		挠度	$W_{max}=\frac{ql^4}{384EI}$

序次	图类	图　　示	项目	计　　算　　式
4	荷载		反力	$R_A = R_B = qa$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \dfrac{qa^3}{3l}$
	剪力		挠度	$W_{max} = \dfrac{qa^3 l}{24EI}\left(1 - \dfrac{a}{l}\right)$
5	荷载		反力	$R_A = \dfrac{qa}{2}(2 - 2a^2 + a^3);\quad R_B = \dfrac{qa^3}{2l^2}(2 - a)$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_A = -\dfrac{qa^2}{12}(6 - 8a + 3a^2)$ 当$x = \dfrac{R_A}{q}$时；$M_{max} = \dfrac{R^2{}_A}{2q} + M_A$
	剪力		挠度	AC段：$W_x = \dfrac{1}{6EI}\left[-R_A x^3 - 3M_A x^2 + \dfrac{qx^4}{4}\right]$ BC段：$W_x = \dfrac{1}{6EI}\left[-R_A x^3 - 3M_A x^2 + \dfrac{qa}{4}(a^3 - 4a^2 x + 6ax^2 - 4x^3)\right]$
6	荷载		反力	$R_A = R_B = \dfrac{qb}{2}$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \dfrac{qbl}{24}\left(3 - 3\dfrac{b}{l} + \dfrac{b^2}{l^2}\right)$
	剪力		挠度	$W_{max} = \dfrac{qbl^3}{384EI}\left(2 - 2\dfrac{b^2}{l^2} + \dfrac{b^3}{l^3}\right)$

5.带悬臂的梁（外伸梁）

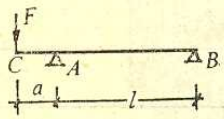
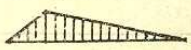
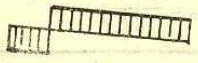
外伸梁的反力、剪力、弯矩和挠度　　附表 15-4-19

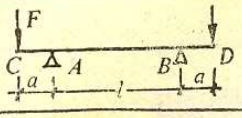
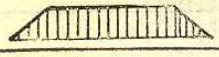
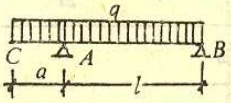
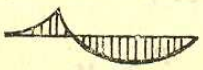
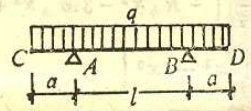
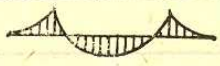
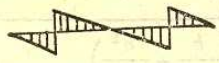
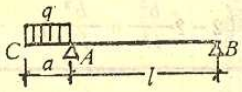
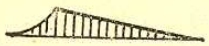
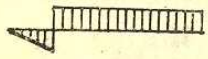
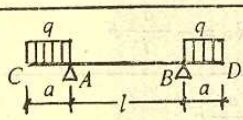
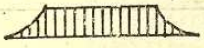
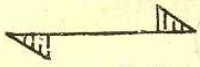
序次	图类	图　　示	项目	计　　算　　式
1	荷载		反力	$R_A = \left(1 + \dfrac{a}{l}\right)F,\quad R_B = -\dfrac{a}{l}F$
	剪力		剪力	$V_C = -F;\ V_B = -R_B = \dfrac{a}{l}F$
	弯矩		弯矩	$M_{max} = M_A = -Fa$
	剪力		挠度	$W_C = \dfrac{Fa^2 l}{3EI}\left(1 + \dfrac{a}{l}\right)$ 当$x = a + 0.5l$时，$W_{min} = -0.0642\dfrac{Fal^2}{EI}$

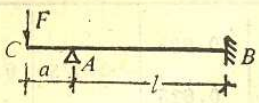
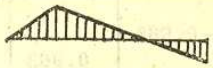
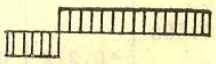
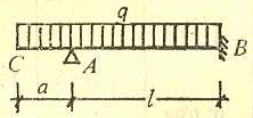
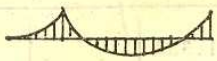
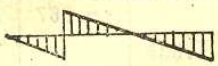
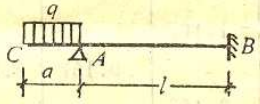
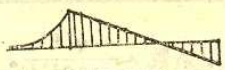
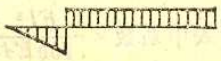
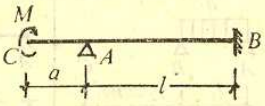
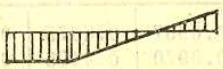
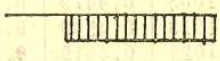
序次	图类	图　　示	项目	计　　算　　式
4	荷载		反力	$R_A = R_B = qa$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{qa^3}{3l}$
	剪力		挠度	$W_{max} = \frac{qa^3 l}{24EI}\left(1 - \frac{a}{l}\right)$
5	荷载		反力	$R_A = \frac{qa}{2}(2 - 2a^2 + a^3);\quad R_B = \frac{qa^3}{2l^2}(2 - a)$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_A = -\frac{qa^2}{12}(6 - 8a + 3a^2)$ 当$x = \frac{R_A}{q}$时；$M_{max} = \frac{R^2_A}{2q} + M_A$
	剪力		挠度	AC段：$W_x = \frac{1}{6EI}\left[-R_A x^3 - 3M_A x^2 + \frac{qx^4}{4}\right]$ BC段：$W_x = \frac{1}{6EI}\left[-R_A x^3 - 3M_A x^2 + \frac{qa}{4}(a^3 - 4a^2 x + 6ax^2 - 4x^3\right]$
6	荷载		反力	$R_A = R_B = \frac{qb}{2}$
	剪力		剪力	$V_A = R_A;\ V_B = -R_B$
	弯矩		弯矩	$M_{max} = \frac{qbl}{24}\left(3 - 3\frac{b}{l} + \frac{b^2}{l^2}\right)$
	剪力		挠度	$W_{max} = \frac{qbl^3}{384EI}\left(2 - 2\frac{b^2}{l^2} + \frac{b^3}{l^3}\right)$

5.带悬臂的梁（外伸梁）

外伸梁的反力、剪力、弯矩和挠度　　附表 15-4-19

序次	图类	图　　示	项目	计　　算　　式
1	荷载		反力	$R_A = \left(1 + \frac{a}{l}\right)F,\quad R_B = -\frac{a}{l}F$
	剪力		剪力	$V_C = -F;\ V_B = -R_B = \frac{a}{l}F$
	弯矩		弯矩	$M_{max} = M_A = -Fa$
	剪力		挠度	$W_C = \frac{Fa^2 l}{3EI}\left(1 + \frac{a}{l}\right)$ 当$x = a + 0.5l$时，$W_{min} = -0.0642\frac{Fal^2}{EI}$

序次	图类	图示	项目	计算式
2	荷载		反力	$R_A = R_B = F$
			剪力	$V_A = -R_A;\ V_B = R_B$
	弯矩		弯矩	$M_A = M_B = -Fa$
	剪力		挠度	$W_C = W_D = \frac{Fa^2l}{6EI}\left(3+2\frac{a}{l}\right)$ 当$x = a + 0.5l$时，$W_{min} = -\frac{Fal^2}{8EI}$
3	荷载		反力	$R_A = \frac{ql}{2}\left(1+\frac{a}{l}\right)^2;\quad R_B = \frac{ql}{2}\left(1-\frac{a}{l}\right)^2$
			剪力	$V_{A左} = -qa;\ V_{A右} = R_A - qa;\ V_B = -R_B$
	弯矩		弯矩	$M_A = -\frac{1}{2}qa^2$ 若$l > a$，当$x = \frac{1}{2}\left(1+\frac{a}{2}\right)^2$时，$M_{max} = \frac{ql^2}{8}\left(1-\frac{a^2}{l^2}\right)^2$
	剪力		挠度	$W_C = \frac{qal^3}{24EI}\left(-1+4\frac{a^2}{l^2}+3\frac{a^3}{l^3}\right)$
4	荷载		反力	$R_A = R_B = \frac{ql}{2}\left(1+2\frac{a}{l}\right) = \frac{q}{2}(l+2a)$
			剪力	$V_{A左} = -qa;\ V_{A右} = \frac{1}{2}ql;\ V_{B左} = -\frac{1}{2}ql;\ V_{B右} = qa$
	弯矩		弯矩	$M_A = M_B = \frac{1}{2}qa^2;\ M_{max} = \frac{ql^2}{8}\left(1-4\frac{a^2}{l^2}\right)$
	剪力		挠度	$W_{max} = \frac{ql^4}{384EI}\left(5-24\frac{a^2}{l^2}\right)$
5	荷载		反力	$R_A = \frac{qa}{2}\left(2+\frac{a}{l}\right);\ R_B = -\frac{qa^2}{2l}$
			剪力	$V_{A左} = -qa;\ V_{A右} = V_B = -R_B = \frac{qa^2}{l}$
	弯矩		弯矩	$M_{max} = M_A = -\frac{qa^2}{2}$
	剪力		挠度	$W_C = \frac{qa^3l}{24EI}\left(4+\frac{3a}{l}\right)$ 当$x = a + 0.423l$时，$W_{min} = -0.0321\frac{qa^2l^2}{EI}$
6	荷载		反力	$R_A = R_B = qa$
			剪力	$V_A = -R_A;\ V_B = R_B$
	弯矩		弯矩	$M_A = M_B = -\frac{1}{2}qa^2$
	剪力		挠度	$W_C = W_D = \frac{qa^3l}{8EI}\left(2+\frac{a}{l}\right)$ 当$x = a + 0.5l$时，$W_{min} = \frac{qa^2l^2}{16EI}$

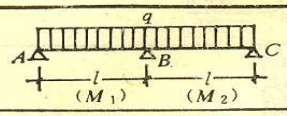
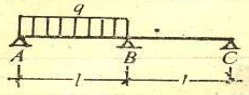
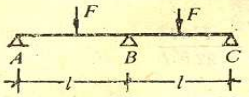
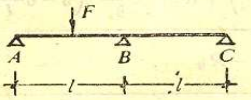
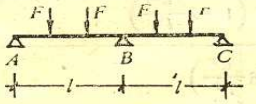
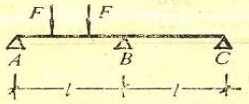
序次	图类	图示	项目	计算式
7	荷载		反力	$R_A=\frac{F}{2}\left(2+3\frac{a}{l}\right)$；$R_B=-\frac{3Fa}{2l}$
			剪力	$V_A=-R_A$；$V_B=R_B$
	弯矩		弯矩	$M_A=-Fa$；$M_B=\frac{Fa}{2}$
	剪力		挠度	$W_C=\frac{Fa^2l}{12EI}\left(3+4\frac{a}{l}\right)$ 当$x=a+\frac{l}{3}$时，$W_{min}=-\frac{Fal^2}{27EI}$
8	荷载		反力	$R_A=\frac{ql}{8}\left(3+8\frac{a}{l}+6\frac{a^2}{l^2}\right)$；$R_B=\frac{ql}{8}\left(5-6\frac{a^2}{l^2}\right)$
			剪力	$V_{A左}=-qa$；$V_{A右}=R_B$；$V_B=-R_B$
	弯矩		弯矩	$M_A=-\frac{qa^2}{2}$；$M_B=-\frac{ql^2}{8}\left(1-2\frac{a^2}{l^2}\right)$
	挠度		挠度	$W_C=\frac{qal^3}{48EI}\left(-1+6\frac{a^2}{l^2}+6\frac{a^3}{l^3}\right)$
9	荷载		反力	$R_A=\frac{qa}{4}\left(4+3\frac{a}{l}\right)$；$R_B=-\frac{3qa^2}{4l}$
			剪力	$V_{A左}=-qa$；$V_{A右}=V_B=R_B$
	弯矩		弯矩	$M_A=-\frac{qa^2}{2}$；$M_B=\frac{qa^2}{4}$
	挠度		挠度	$W_C=\frac{qa^3l}{8EI}\left(1+\frac{a}{l}\right)$
10	荷载		反力	$R_A=-\frac{3M}{2l}$；$R_B=\frac{3M}{2l}$
			剪力	$V_A=-R_A$；$V_B=-R_B$
	弯矩		弯矩	$M_A=M$；$M_B=-\frac{M}{2}$
	剪力		挠度	$W_C=\frac{Mal}{4EI}\left(1+2\frac{a}{l}\right)$ 当$x=a+\frac{1}{3}$时，$W_{max}=\frac{Ml^2}{27EI}$

6.二跨连续梁

二跨等跨连续梁和二跨不等跨连续梁的内力和挠度的计算系数分别示于附表15-4-和附表15-4-21中。

二等跨梁的内力和挠度系数

附表 15-4-20

序次	荷载图	跨内最大弯距 M_1	跨内最大弯距 M_2	支座弯距 M_B	剪力 V_A	剪力 $V_{B左}$ / $V_{B右}$	剪力 V_C	跨度中点挠度 W_1	跨度中点挠度 W_2
1		0.070	0.070	−0.125	0.375	−0.625 0.625	−0.375	0.521	0.521
2		0.096	—	−0.063	0.437	−0.563 0.063	0.063	0.912	−0.391
3		0.156	0.156	−0.188	0.312	−0.688 0.688	−0.312	0.911	0.911
4		0.203	—	−0.094	0.406	−0.594 0.094	0.094	1.497	−0.586
5		0.222	0.222	−0.333	0.667	−1.333 1.333	−0.667	1.466	1.466
6		0.278	—	−0.167	0.833	−1.167 0.167	0.167	2.508	−1.042

注：1.在均布荷载作用下：M = 表中系数 × ql^2；V = 表中系数 × ql；W = 表中系数 × $\frac{ql^4}{100EI}$。

2.在集中荷载作用下：M = 表中系数 × Fl；V = 表中系数 × F；W = 表中系数 × $\frac{Fl^3}{100EI}$。

二不等跨梁的内力和挠度系数

附表 15-4-21

荷载 / n 系数	M_B (M_{max})	M_{BA}	M_{BC}	V_A	$V_{B左}$ (V_{max})	$V_{B右}$ (V_{max})	V_C	M_{AB} (M_{max})	V_A (V_{max})	M_{BC} (M_{max})	V_C (V_{max})
1.0	−0.1250	0.0703	0.0703	0.3750	−0.6250	0.6250	−0.3750	0.0957	0.4375	0.0957	−0.4375
1.1	−0.1388	0.0653	0.0898	0.3613	−0.6387	0.6761	−0.4239	0.0970	0.4405	0.1142	−0.4780
1.2	−0.1550	0.0595	0.1108	0.3450	−0.6550	0.7292	−0.4708	0.0982	0.4432	0.1343	−0.5182
1.3	−0.1738	0.0532	0.1333	0.3263	−0.6737	0.7836	−0.5164	0.0993	0.4457	0.1558	−0.5582
1.4	−0.1950	0.0465	0.1572	0.3050	−0.6950	0.8393	−0.5607	0.1003	0.4479	0.1788	−0.5979
1.5	−0.2188	0.0396	0.1825	0.2813	−0.7187	0.8958	−0.6042	0.1013	0.4500	0.2032	−0.6375
1.6	−0.2450	0.0325	0.2092	0.2550	−0.7450	0.9531	−0.6469	0.1021	0.4519	0.2291	−0.6769
1.7	−0.2733	0.0256	0.2374	0.2263	−0.7737	1.0110	−0.6890	0.1029	0.4537	0.2564	−0.7162
1.8	−0.3050	0.0190	0.2669	0.1950	−0.8050	1.0694	−0.7306	0.1037	0.4554	0.2850	−0.7554
1.9	−0.3388	0.0130	0.2978	0.1613	−0.8387	1.1283	−0.7717	0.1044	0.4569	0.3155	−0.7944
2.0	−0.3750	0.0078	0.3301	0.1250	−0.8750	1.1875	−0.8125	0.1050	0.4583	0.3472	−0.8333
2.25	−0.4766	0.0003	0.4170	0.0234	−0.9766	1.3368	−0.9132	0.1065	0.4615	0.4327	−0.9303
2.5	−0.5938	负 值	0.5126	−0.0938	−1.0938	1.4875	−1.0125	0.1078	0.4643	0.5272	−1.0268

注：1.M = 表中系数 × ql^2；V = 表中系数 × ql；

2.(M_{max})、(V_{max})表示它为相应跨内的最大内力。