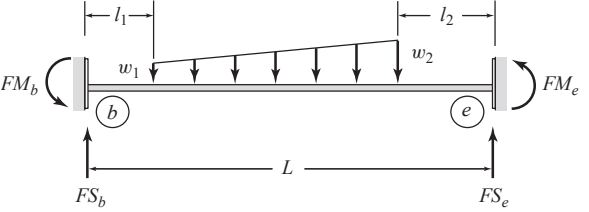
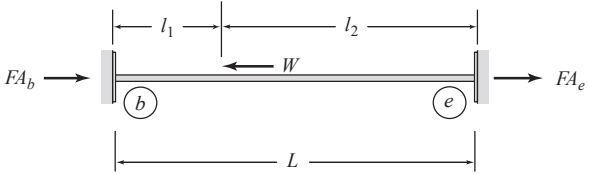
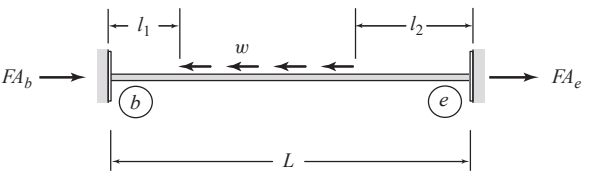
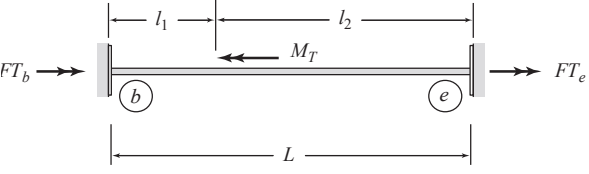


FIXED-END FORCE EXPRESSIONS

Fixed-End Moments, Shears and Axial Forces for Various Loading Conditions

No.	Loading	Equations for Fixed-End Moments, Shears, and Axial Forces
1.		$FS_b = \frac{Wl_2^2}{L^3}(3l_1 + l_2)$ $FM_b = \frac{Wl_1l_2^2}{L^2}$ $FS_e = \frac{Wl_1^2}{L^3}(l_1 + 3l_2)$ $FM_e = -\frac{Wl_1^2l_2}{L^2}$
2.		$FS_b = -\frac{6Ml_1l_2}{L^3}$ $FM_b = \frac{Ml_2}{L^2}(l_2 - 2l_1)$ $FS_e = \frac{6Ml_1l_2}{L^3}$ $FM_e = \frac{Ml_1}{L^2}(l_1 - 2l_2)$
3.		$FS_b = \frac{wL}{2} \left[1 - \frac{l_1}{L^4}(2L^3 - 2l_1^2L + l_1^3) - \frac{l_2^3}{L^4}(2L - l_2) \right]$ $FM_b = \frac{wL^2}{12} \left[1 - \frac{l_1^2}{L^4}(6L^2 - 8l_1L + 3l_1^2) - \frac{l_2^3}{L^4}(4L - 3l_2) \right]$ $FS_e = \frac{wL}{2} \left[1 - \frac{l_1^3}{L^4}(2L - l_1) - \frac{l_2}{L^4}(2L^3 - 2l_2^2L + l_2^3) \right]$ $FM_e = -\frac{wL^2}{12} \left[1 - \frac{l_1^3}{L^4}(4L - 3l_1) - \frac{l_2^2}{L^4}(6L^2 - 8l_2L + 3l_2^2) \right]$

No.	Loading	Equations for Fixed-End Moments, Shears, and Axial Forces
4.		$FS_b = \frac{w_1(L-l_1)^3}{20L^3} \left\{ (7L+8l_1) - \frac{l_2(3L+2l_1)}{(L-l_1)} \right. \\ \left. \times \left[1 + \frac{l_2}{L-l_1} + \frac{l_2^2}{(L-l_1)^2} \right] + \frac{2l_2^3}{(L-l_1)^3} \right\} \\ + \frac{w_2(L-l_1)^3}{20L^3} \left\{ (3L+2l_1) \left[1 + \frac{l_2}{L-l_1} \right. \right. \\ \left. \left. + \frac{l_2^2}{(L-l_1)^2} \right] - \frac{l_2^3}{(L-l_1)^2} \left[2 + \frac{15L-8l_2}{L-l_1} \right] \right\}$ $FM_b = \frac{w_1(L-l_1)^3}{60L^2} \left\{ 3(L+4l_1) - \frac{l_2(2L+3l_1)}{L-l_1} \right. \\ \left. \times \left[1 + \frac{l_2}{L-l_1} + \frac{l_2^2}{(L-l_1)^2} \right] + \frac{3l_2^3}{(L-l_1)^3} \right\} \\ + \frac{w_2(L-l_1)^3}{60L^2} \left\{ (2L+3l_1) \left[1 + \frac{l_2}{L-l_1} \right. \right. \\ \left. \left. + \frac{l_2^2}{(L-l_1)^2} \right] - \frac{3l_2^3}{(L-l_1)^2} \left[1 + \frac{5L-4l_2}{L-l_1} \right] \right\}$ $FS_e = \left(\frac{w_1+w_2}{2} \right) (L-l_1-l_2) - FS_b$ $FM_e = \frac{L-l_1-l_2}{6} [w_1(-2L+2l_1-l_2) \\ -w_2(L-l_1+2l_2)] + FS_b(L) - FM_b$
5.		$FA_b = \frac{Wl_2}{L}$ $FA_e = \frac{Wl_1}{L}$
6.		$FA_b = \frac{w}{2L} (L-l_1-l_2)(L-l_1+l_2)$ $FA_e = \frac{w}{2L} (L-l_1-l_2)(L+l_1-l_2)$
7.		$FT_b = \frac{M_T l_2}{L}$ $FT_e = \frac{M_T l_1}{L}$