

$$7.6-1. v'_A = -\frac{5 PL^2}{8 EI}, \quad v_A = \frac{17 PL^3}{48 EI}$$

$$7.6-3. v'_C = -\frac{43 p_0 L^3}{48 EI}, \quad v_C = -\frac{41 p_0 L^4}{96 EI}$$

$$7.6-5. v'_C = -\frac{7 w_0 L^3}{48 EI}, \quad v_C = -\frac{41 w_0 L^4}{384 EI}$$

$$7.6-7. v'_A = -\frac{19 PL^2}{128 EI}, \quad v_C = -\frac{11 PL^3}{256 EI}$$

$$7.6-9. (a) v'(x) = \frac{M_0}{6 EIL} (4L^2 - 6Lx - 3x^2),$$

$$(b) v_{\max} = 0.1881 \left(\frac{M_0 L^2}{EI} \right)$$

$$7.6-11. (a) v'(x) = \frac{P}{162 EI} (2L^2 - 27x^2),$$

$$(b) v_{\max} = \frac{2\sqrt{6} PL^3}{2187 EI}$$

$$7.6-13. (a) (v_1)_B = (v_2)_B = -\frac{1}{6} \frac{w_0 L^4}{EI},$$

$$(b) (v_1)_B = -\frac{1}{4} \frac{w_0 L^3}{EI}, \quad (c) (v_2)_C = \frac{5}{24} \frac{w_0 L^3}{EI}$$

$$7.6-15. v'_C = -1.554(10^{-3}) \text{ rad}, \quad v_C = -0.1570 \text{ in.}$$

$$7.6-17. v'_A = -4.19(10^{-3}) \text{ rad}, \quad v_B = -0.01497 \text{ mm}$$

$$7.6-19. v'_A = -2.98(10^{-3}) \text{ rad}, \quad v_B = -0.0893 \text{ in.}$$

$$7.6-21. (a) \delta_B = 0.0927 \text{ in.}$$

$$(b) v(x) = -\frac{w_0 x}{24 EI} (L^3 - 2Lx^2 + x^3) - \frac{\delta_B x}{L},$$

$$(c) \delta_{\max} = 0.247 \text{ in.}$$

$$7.6-23. v_B \equiv v(L) = \frac{2p_0}{3EI} \left(\frac{L}{\pi} \right)^4 (\pi^3 - 24)$$

$$7.6-25. v_D \equiv v(L) = -\frac{7w_0 L^4}{128 EI}$$

$$7.6-27. v_B \equiv v \left(\frac{L}{2} \right) = -\frac{5w_0 L^4}{768 EI}$$

$$7.6-29. v_B \equiv v \left(\frac{L}{4} \right) = -\frac{5w_0 L^4}{768 EI}$$

$$7.6-31. (a) R_A = \frac{3w_0 L}{8},$$

$$(b) v(x) = \frac{w_0 L^4}{48 EI} \left[-2 \left(\frac{x}{L} \right)^4 + 3 \left(\frac{x}{L} \right)^3 - \left(\frac{x}{L} \right) \right]$$

$$7.6-33. (a) R_A = \frac{w_0 L}{10},$$

$$v(x) = \frac{w_0 L^4}{120 EI} \left[-\left(\frac{x}{L} \right)^5 + 2 \left(\frac{x}{L} \right)^3 - \left(\frac{x}{L} \right) \right]$$

$$(b) \delta_{\max} = \frac{2\sqrt{5} w_0 L^4}{1875 EI}$$

$$7.6-35. (a) R_A = -\frac{p_0 L}{2},$$

$$v(x) = \frac{p_0 L^4}{24 EI} \left[\left(\frac{x}{L} \right)^4 - 2 \left(\frac{x}{L} \right)^3 + \left(\frac{x}{L} \right)^2 \right]$$

$$7.6-37. (a) R_A = \frac{3w_0 L}{20}, \quad M_A = -\frac{3w_0 L^2}{30},$$

$$v(x) = \frac{w_0 L^4}{120 EI} \left[-\left(\frac{x}{L} \right)^5 + 3 \left(\frac{x}{L} \right)^3 - 2 \left(\frac{x}{L} \right)^2 \right],$$

$$(b) \delta_{\max} = 1.309(10^{-3}) \frac{w_0 L^4}{EI}$$

$$7.6-39. (a) R_A = \frac{w_0 L_1}{8} \left(\frac{5L_1^3 E_2 A_2 + 24L_2 E_1 I_1}{L_1^3 E_2 A_2 + 3L_2 E_1 I_1} \right),$$

$$(b) v(x) = -\frac{w_0 x^2}{24 E_1 I_1} (6L_1^2 - 4L_1 x + x^2) + \frac{w_0 L_1 x^2}{16 E_1 I_1} \left(\frac{L_1^3 E_2 A_2}{L_1^3 E_2 A_2 + 3L_2 E_1 I_1} \right) (3L_1 - x)$$

$$7.6-41. (a) R_A = \frac{w_0 L}{2} \left[\left(\frac{a}{L} \right)^4 - 2 \left(\frac{a}{L} \right)^3 + 2 \left(\frac{a}{L} \right) \right],$$

$$M_A = \frac{w_0 L^2}{12} \left[-3 \left(\frac{a}{L} \right)^4 + 8 \left(\frac{a}{L} \right)^3 - 6 \left(\frac{a}{L} \right)^2 \right],$$

$$v_1(x) = -\frac{w_0 x^4}{24 EI} + \frac{w_0 L^2 x^3}{12 EI} \left[\left(\frac{a}{L} \right)^4 - 2 \left(\frac{a}{L} \right)^3 + 2 \left(\frac{a}{L} \right) \right] + \frac{w_0 L^2 x^2}{24 EI} \left[-3 \left(\frac{a}{L} \right)^4 + 8 \left(\frac{a}{L} \right)^3 - 6 \left(\frac{a}{L} \right)^2 \right]$$

$$7.6-43. (a) R_A = \frac{7w_0 L}{32},$$

$$(b) v_1(x) = \frac{w_0 L^4}{768 EI} \left[-32 \left(\frac{x}{L} \right)^4 + 28 \left(\frac{x}{L} \right)^3 - 3 \left(\frac{x}{L} \right) \right]$$

$$7.6-45. (a) R_A = \frac{48p_0 L}{\pi^4} (\pi - 4),$$

$$M_A = \frac{4p_0 L^2}{\pi^4} (24 - 4\pi - \pi^2),$$

$$v(x) = \frac{16p_0}{EI} \left(\frac{L}{\pi} \right)^4 \left[\cos \left(\frac{\pi x}{2L} \right) - 1 \right] + \frac{8p_0 L x^3}{\pi^4 EI} (\pi - 4) + \frac{8p_0 L^2 x^2}{\pi^4 EI} (6 - \pi)$$

$$7.6-47. v_C = -\frac{7w_0 L^4 H}{128 E(L^3 A + 3HI)}$$

$$7.6-49. T = \frac{5w_0 L}{8} \left(\frac{L^3 A}{L^3 A + 48HI} \right)$$

$$7.6-51. R_B = \frac{w_0 L}{2}, \quad R_C = -\frac{w_0 L}{16}, \quad M_C = \frac{w_0 L^2}{48}$$

$$7.6-53. (a) (M_1)_B = \frac{2}{3} M_0, \quad (M_2)_B = -\frac{1}{3} M_0,$$

$$(b) R_A = \frac{2}{3} \frac{M_0}{L}$$

$$7.6-55. (a) (M_1)_B = (M_2)_B = -\frac{12}{37} P_0 L,$$

$$(b) R_A = -\frac{26}{37} P_0$$

$$7.6-57. (a) (M_1)_B = (M_2)_B = -\frac{1}{60} w_0 L^2,$$

$$(b) R_A = \frac{1}{5} w_0 L$$