

7.7-1. $R_A = \frac{3M_0}{2L}$

7.7-3. (a) $\theta_B = \frac{P_0 L^2}{37EI}$, $\delta_B = \frac{8P_0 L^3}{111EI}$,
 (b) $R_A = -\frac{26P_0}{37}$, $M_A = -\frac{14P_0 L}{37}$

7.7-5. (a) $\theta_B = \frac{w_0 L^3}{96EI}$,
 (b) $R_A = \frac{9w_0 L}{16}$, $M_A = \frac{5w_0 L^2}{48}$, $R_B = \frac{w_0 L}{2}$

7.7-7. (a) $\theta_B = -\frac{w_0 L^3}{24EI}$,
 (b) $R_A = \frac{w_0 L}{4}$, $M_A = 0$, $R_B = \frac{27w_0 L}{16}$

7.7-9. (a) $\theta_B = -\frac{p_0 L^3}{240EI}$, $\delta_B = \frac{17p_0 L^4}{480EI}$,
 (b) $R_A = -\frac{19p_0 L}{20}$, $M_A = -\frac{73p_0 L^2}{240}$

7.7-11. (a) $\theta_A = -\frac{w_0 L^3}{140EI}$, $\theta_B = -\frac{w_0 L^3}{420EI}$,
 (b) $R_A = \frac{13w_0 L}{140}$, $R_B = \frac{25w_0 L}{28}$

7.7-13. (a) $\theta_A = -\frac{5w_0 L^3}{288EI}$, $\theta_B = \frac{w_0 L^3}{72EI}$, $\theta_C = -\frac{w_0 L^3}{144EI}$,
 (b) $R_A = \frac{11w_0 L}{24}$

7.7-15. (a) $\theta_A = \frac{w_0 L^3}{96EI}$, $\theta_B = -\frac{w_0 L^3}{16EI}$, $\theta_C = \frac{11w_0 L^3}{96EI}$,
 (b) $R_A = \frac{3w_0 L}{16}$

7.7-17. $P_A = \frac{12EI\delta_A}{L^3}$, $M_A = \frac{6EI\delta_A}{L^2}$, $P_B = -P_A$,
 $M_B = M_A$, $v(x) = \delta_A \left[1 - 3\left(\frac{x}{L}\right)^2 + 2\left(\frac{x}{L}\right)^3 \right]$

CHAPTER 8

8.3-1. $\sigma_n = 32.0$ ksi (T), $\tau_{nt} = 22.0$ ksi
 8.3-3. $\sigma_n = 2520$ psi (C), $\tau_{nt} = -3570$ psi
 8.3-5. $\sigma_{x'} = 1.527$ ksi, $\sigma_{y'} = 2.07$ ksi, $\tau_{x'y'} = -4.99$ ksi
 8.3-7. $\sigma_{x'} = 45.3$ MPa, $\sigma_{y'} = -29.3$ MPa,
 $\tau_{x'y'} = -24.6$ MPa
 8.3-9. $\sigma_{x'} = -1150$ psi, $\sigma_{y'} = -850$ psi, $\tau_{x'y'} = -6400$ psi
 8.3-11. $\sigma_{x'} = 6.28$ MPa, $\sigma_{y'} = -28.3$ MPa,
 $\tau_{x'y'} = 18.06$ MPa
 8.3-13. $\sigma_x = \sigma_y = 3.50$ ksi, $\tau_{xy} = -2.50$ ksi
 8.3-15. $\sigma_{y'} = 0$, $\theta = 45^\circ$
 8.3-17. $(\sigma_0)_{\max} = (\sigma_0)_s = 150.1$ psi
 8.3-19. $P = 12.00$ kN
 8.3-21. $M = 32.0$ kip·in.

8.4-1. (a) $\sigma_1 = 4000$ psi, $\sigma_2 = -6000$ psi, $\theta_{p1} = -18.43^\circ$
 (b) $\tau_{\max} = 5000$ psi, $\sigma_{s1} = \sigma_{s2} = -1000$ psi,
 $\theta_{s1} = -63.43^\circ$
 8.4-3. (a) $\sigma_1 = 12.77$ MPa, $\sigma_2 = -8.77$ MPa,
 $\theta_{p1} = -10.90^\circ$
 (b) $\tau_{\max} = 10.77$ MPa, $\sigma_{s1} = \sigma_{s2} = 2.00$ MPa,
 $\theta_{s1} = -55.9^\circ$
 8.4-5. (a) $\sigma_1 = 14.00$ ksi, $\sigma_2 = -6.00$ ksi, $\theta_{p1} = 71.6^\circ$,
 (b) $\tau_{\max} = 10.00$ ksi, $\sigma_{s1} = \sigma_{s2} = 4.00$ ksi, $\theta_{s1} = 26.6^\circ$
 8.4-7. (a) $\sigma_1 = 12.00$ ksi, $\sigma_2 = 2.00$ ksi, $\theta_{p1} = -63.4^\circ$,
 (b) $\tau_{\max} = 5.00$ ksi, $\sigma_{s1} = \sigma_{s2} = 7.00$ ksi, $\theta_{s1} = 71.6^\circ$
 8.4-9. (a) $\sigma_1 = 20.1$ MPa, $\sigma_2 = 5.93$ MPa, $\theta_{p1} = 22.5^\circ$,
 (b) $\tau_{\max} = 7.07$ MPa, $\sigma_{s1} = \sigma_{s2} = 13.00$ MPa,
 $\theta_{s1} = -22.5^\circ$
 8.4-11. (a) $\sigma_1 = 6.00$ ksi, $\sigma_2 = -14.00$ ksi, $\theta_{p1} = 63.4^\circ$,
 (b) $\tau_{\max} = 10.00$ ksi, $\sigma_{s1} = \sigma_{s2} = -4.00$ ksi, $\theta_{s1} = 18.43^\circ$
 8.4-13. $\tau = 8.66$ MPa, $\sigma_1 = 8.00$ MPa, $\sigma_2 = -12.00$ MPa
 8.4-15. $\sigma_y = \sigma = 130$ MPa, $\tau_{xy} = -\tau = -72$ MPa,
 $\sigma_1 = 178.0$ MPa

For problems in Section 8.5, use the MDSolids "Mohr's Circle" option to check your Mohr's-circle solutions.

8.5-1. $\sigma_n = 32.0$ ksi, $\tau_{nt} = 22.0$ ksi
 8.5-3. $\sigma_n = -2520$ psi, $\tau_{nt} = -3570$ psi
 8.5-5. $\sigma_n = -2520$ psi, $\tau_{nt} = -3570$ psi
 8.5-7. $\sigma_{x'} = 45.3$ MPa, $\sigma_{y'} = -29.3$ MPa,
 $\tau_{x'y'} = -24.6$ MPa
 8.5-9. $\sigma_{x'} = 6.28$ MPa, $\sigma_{y'} = -28.3$ MPa,
 $\tau_{x'y'} = 18.06$ MPa
 8.5-11. (a) Mohr's circle, (b) $\sigma_n = \frac{\sigma_x}{2}(1 + \cos 2\theta)$,
 $\tau_{nt} = -\left(\frac{\sigma_x}{2}\right) \sin 2\theta$, (c) $\tau_{\max} = \frac{\sigma_x}{2}$
 8.5-13. (a) Mohr's circle, (b) $\sigma_1 = 4000$ psi,
 $\sigma_2 = -6000$ psi, $\theta_{p1} = -18.43^\circ$, (c) $\tau_{\max} = 5000$ psi,
 $\sigma_{s1} = \sigma_{s2} = -1000$ psi, $\theta_{s1} = -63.4^\circ$
 8.5-15. (a) Mohr's circle, (b) $\sigma_1 = 12.77$ MPa,
 $\sigma_2 = -8.77$ MPa, $\theta_{p1} = -10.90^\circ$, (c) $\tau_{\max} = 10.77$ MPa,
 $\sigma_{s1} = \sigma_{s2} = 2.00$ MPa, $\theta_{s1} = -55.9^\circ$
 8.5-17. (a) Mohr's circle, (b) $\sigma_1 = 38.2$ ksi,
 $\sigma_2 = -2.62$ ksi, $\theta_{p1} = -14.66^\circ$, (c) $\tau_{\max} = 20.4$ ksi,
 $\sigma_{s1} = \sigma_{s2} = 17.80$ ksi, $\theta_{s1} = 30.3^\circ$