

Chapter 2:

2.22 (40 lb) 20.0 lb, -34.6 lb; (50 lb) -38.3 lb, -32.1 lb;
(60 lb) 54.4 lb, 25.4 lb.

2.24: $F_1 = (105)\mathbf{i} + (100)\mathbf{j}$ N, $F_2 = (-70.2)\mathbf{i} + (240)\mathbf{j}$ N, $F_3 = (120)\mathbf{i} + (-225)\mathbf{j}$ N,

2.26 (a) 621 N. (b) 160.8 N.

2.30: $P = 228.4$ N, $P_x = 140.6$ N

2.46 (a) 172.7 lb. (b) 231 lb.

2.58 (a) 1294 N. (b) 62.5°.

2.66 (a) 22.5°. (b) 630 N.

2.72 (a) -237 N, +258 N, +282 N.
(b) 121.8°, 55.0°, 51.1°.

2.74 (a) +37.1 lb, -68.8 lb, +33.4 lb.
(b) 64.1°, 144.0°, 66.8°.

2.88 +50 lb, +250 lb, +185 lb.

2.94 913 lb; $\theta_x = 50.6^\circ$, $\theta_y = 117.6^\circ$, $\theta_z = 51.8^\circ$.

2.110 768 N.

CHAPTER 2

- 2.1** 3.30 kN \searrow 66.6°.
2.3 77.1 lb \nearrow 85.4°.
2.4 139.1 lb \nearrow 67.0°.
2.5 (a) 103.0°. (b) 276 N.
2.6 (a) 25.1°. (b) 266 N.
2.7 (a) 853 lb. (b) 567 lb.
2.8 (a) 938 lb. (b) 665 lb.
2.9 (a) 37.1°. (b) 73.2 N.
2.10 (a) 44.7 N. (b) 107.1 N.
2.13 (a) 368 lb \rightarrow . (b) 212.5 lb.
2.17 100.3 N \nearrow 21.2°.
2.21 (80 N) 61.3 N, 51.4 N; (120 N) 41.0 N, 112.8 N; (150 N) -122.9 N, 86.0 N.
2.22 (40 lb) 20.0 lb, -34.6 lb; (50 lb) -38.3 lb, -32.1 lb; (60 lb) 54.4 lb, 25.4 lb.
2.23 (102 lb) -48.0 lb, 90.0 lb; (106 lb) 56.0 lb, 90.0 lb; (200 lb) -160.0 lb, -120.0 lb.
2.25 (a) 1465 N. (b) 840 N \downarrow .
2.26 (a) 621 N. (b) 160.8 N.
2.27 (a) 523 lb. (b) 428 lb.
2.28 (a) 373 lb. (b) 286 lb.
2.31 193.0 N \swarrow 36.6°.
2.32 251 N \swarrow 85.3°.
2.33 54.9 lb \swarrow 48.9°.
2.34 163.4 lb \swarrow 21.5°.
2.35 309 N \nearrow 86.6°.
2.36 226 N \nearrow 62.3°.
2.39 (a) 21.7°. (b) 229 N.
2.40 (a) 580 N. (b) 300 N.
2.41 (a) 95.1 lb. (b) 95.0 lb.
2.43 (a) 440 N. (b) 326 N.
2.44 (a) 2.13 kN. (b) 1.735 kN.
2.45 (a) 1244 lb. (b) 115.4 lb.
2.46 (a) 172.7 lb. (b) 231 lb.
2.49 $F_C = 6.40$ kN; $F_D = 4.80$ kN.
2.50 $F_B = 15.00$ kN; $F_C = 8.00$ kN.
2.51 $F_A = 1303$ lb; $F_B = 420$ lb.
2.52 $P = 477$ lb; $Q = 127.7$ lb.
2.53 (a) 182.5 kN. (b) 15.22 kN.
2.54 (a) 26.3 kN. (b) 101.3 kN.
2.57 (a) 1081 N. (b) 82.5°.
2.58 (a) 1294 N. (b) 62.5°.
2.59 (a) 60°. (b) 230 lb.
2.60 (a) \swarrow 25°. (b) 104.6 lb.
2.61 (a) 50°. (b) 1.503 kN.
2.62 5.80 m.
2.65 602 N \swarrow 46.8° or 1365 N \nearrow 46.8°.
2.66 (a) 22.5°. (b) 630 N.
2.67 (a) 300 lb. (b) 300 lb. (c) 200 lb. (d) 200 lb. (e) 150 lb.
2.68 (b) 200 lb. (d) 150 lb.
2.71 (a) +220 N, +544 N, +126.8 N. (b) 68.5°, 25.0°, 77.8°.
2.72 (a) -237 N, +258 N, +282 N. (b) 121.8°, 55.0°, 51.1°.
2.73 (a) +56.4 lb, -103.9 lb, -20.5 lb. (b) 62.0°, 150.0°, 99.8°.
2.74 (a) +37.1 lb, -68.8 lb, +33.4 lb. (b) 64.1°, 144.0°, 66.8°.
2.75 (a) 288 N. (b) 67.5°, 30.0°, 108.7°.
2.76 (a) 100.0 N. (b) 112.5°, 30.0°, 108.7°.
2.79 $F = 900$ N; $\theta_x = 73.2^\circ$, $\theta_y = 110.8^\circ$, $\theta_z = 27.3^\circ$.
2.80 $F = 570$ N; $\theta_x = 55.8^\circ$, $\theta_y = 45.4^\circ$, $\theta_z = 116.0^\circ$.
2.81 (a) 140.3°. (b) $F_x = 79.9$ lb, $F_z = 120.1$ lb; $F = 226$ lb.
2.82 (a) 118.2°. (b) $F_x = 36.0$ lb, $F_y = -90.0$ lb; $F = 110$ lb.
2.85 +192 N, +288 N, -216 N.
2.86 -165 N, +317 N, +238 N.
2.87 +100 lb, +500 lb, -125 lb.
2.88 +50 lb, +250 lb, +185 lb.
2.91 515 N; $\theta_x = 70.2^\circ$, $\theta_y = 27.6^\circ$, $\theta_z = 71.5^\circ$.
2.92 515 N; $\theta_x = 79.8^\circ$, $\theta_y = 33.4^\circ$, $\theta_z = 58.6^\circ$.
2.93 913 lb; $\theta_x = 48.2^\circ$, $\theta_y = 116.6^\circ$, $\theta_z = 53.4^\circ$.
2.94 913 lb; $\theta_x = 50.6^\circ$, $\theta_y = 117.6^\circ$, $\theta_z = 51.8^\circ$.
2.95 748 N; $\theta_x = 120.1^\circ$, $\theta_y = 52.5^\circ$, $\theta_z = 128.0^\circ$.
2.98 $T_{AB} = 490$ N; $T_{AD} = 515$ N.
2.99 1031 N \uparrow .
2.100 956 N \uparrow .
2.103 2100 lb.
2.104 1868 lb.
2.105 1049 lb.
2.106 $T_{AB} = 571$ lb; $T_{AC} = 830$ lb; $T_{AD} = 528$ lb.
2.107 960 N.
2.108 $0 \leq Q < 300$ N.
2.109 845 N.
2.110 768 N.
2.113 $T_{AB} = 974$ lb; $T_{AC} = 531$ lb; $T_{AD} = 533$ lb.
2.114 $T_{AD} = T_{CD} = 29.5$ lb; $T_{BD} = 10.25$ lb.