

ENGR 1990 Engineering Mathematics Homework #4 Answers

1. $\mathbf{F} = -177\mathbf{i} + 177\mathbf{j}$ (lb)
2. $\mathbf{F} = 57.4\mathbf{i} + 81.9\mathbf{j}$ (lb)
3. $|\mathbf{F}| = 158$ (lb), $\theta = 252$ (deg) = 4.39 (rad)
4. $|\mathbf{F}| = 128$ (lb), $\theta = -51.3$ (deg) = -0.896 (rad)
5.
 - a) $\mathbf{F} = -14\mathbf{i} + 138\mathbf{j}$ (lb)
 - b) $|\mathbf{F}| = 138$ (lb)
 - c) $\theta = 95.8$ (deg) = 1.67 (rad)
 - d) $\mathbf{n} = -0.101\mathbf{i} + 0.995\mathbf{j}$
6.
 - a) $\theta = 64.9$ (deg) = 1.13 (rad)
 - b) $\mathbf{F}_{\parallel} = 57.6\mathbf{i} + 43.2\mathbf{j}$ (lb)
 - c) $\mathbf{F}_{\perp} = 92.4\mathbf{i} - 123\mathbf{j}$ (lb)
7.
 - a) $\theta = 46$ (deg) = 0.802 (rad)
 - b) $\mathbf{F}_{\parallel} = 124\mathbf{i} + 71.7\mathbf{j}$ (lb)
 - c) $\mathbf{F}_{\perp} = -74.1\mathbf{i} + 128\mathbf{j}$ (lb)
8. $\mathbf{M}_B = 530\mathbf{k}$ (ft-lb), $d = 3.12$ (ft)
9. $\mathbf{M}_B = -1850\mathbf{k}$ (ft-lb), $d = 8.97$ (ft)
10.
 - a) $\mathbf{W} = -173\mathbf{i} - 100\mathbf{j}$ (lb), $\mathbf{P} = 50\mathbf{i} - 86.6\mathbf{j}$ (lb)
 - b) $\mathbf{f} = 123\mathbf{i}$ (lb), $\mathbf{N} = 187\mathbf{j}$ (lb)