Appendix 1 Homework Problems

Problem A1.1
Determine the x and y components of the force vector shown below.

Solution: $F_x = 692.8 \text{ N}, F_y = 400 \text{ N}$

Problem A1.2
Determine the x, y, and z components of the vector shown below.

Solution: $F_x = 4.17 \text{ kN}, F_y = 2.54 \text{ kN}, F_z = -3.50 \text{ kN}$
Problem A1.3

An 80 lb tension acts along a cable stretching from point O to point A. Based on the dimensions given, break the tension force shown into x, y, and z components.

Solution: $F_x = 56.47$ lbs, $F_y = -37.64$ lbs, $F_z = 42.35$ lbs

Problem A1.4

Determine the x and y components of the sum of the two vectors shown below.

Solution: $F_{\text{total}} = [58.2, 41.7]$ lbs
Problem A1.5

There are two forces acting on a barge as shown below (F₁ and F₂). The magnitude and direction of F₁ is known, but the magnitude and direction of F₂ is not. If the sum of the two forces is 600 N along the x-axis, what must the magnitude and direction of F₂ be?

Solution: F₂ = 390.3 N at 41.2° below the x axis