Week 1

Section 2.2

1. Suppose you walk 18.0 m straight west and then 25.0 m straight north. How far are you from your starting point, and what is the compass direction of a line connecting your starting point to your final position?

2. Suppose you first walk 12.0 m in a direction 20° west of north and then 20.0 m in a direction 40° south of west. How far are you from your starting point, and what is the compass direction of a line connecting your starting point to your final position?

Section 2.3

3. Find the equation of a circle in the x, y plane with center (h, k) and a point (a, b) on its circumference.

4. Calculate the dot product in each of the following cases. Do the vectors form an acute angle, right angle, or obtuse angle?

   (a) $\mathbf{a} = (1, 2, 3)$ and $\mathbf{b} = (4, -5, 6)$

   (b) $\mathbf{c} = (-4, -9)$ and $\mathbf{d} = (-1, 2)$

5. If $\mathbf{a} = (6, -1, 3)$, for what value of y is the vector $\mathbf{b} = (4, y, -2)$ perpendicular to $\mathbf{a}$?

6. Find the projection of the vector $\mathbf{b} = (4, 2, 1)$ on the vector $\mathbf{a} = (5, -3, 3)$.