Exercises:
1. Find the projection of the vector $\vec{u} = (5, 1)$ onto the vector $\vec{v} = (2, \sqrt{17})$.
2. Find the projection of the vector $\vec{u} = (5, 12, 0)$ onto the vector $\vec{v} = (3/5, 4/5, 0)$.
3. A cannonball with velocity of 1200 ft/sec is fired at an angle of 8 degrees above horizontal. Find the horizontal and vertical components of the velocity.
4. Show that vector $\vec{v} = (a, b)$ is perpendicular to the line $ax + by = c$.
5. Find the angle between the lines $3x + y = 5$ and $2x - y = 4$.
6. Calculate the cross product $\vec{u} \times \vec{v}$ where
   (a) $\vec{u} = (2, -2, -1), \vec{v} = (1, 0, -1)$.
   (b) $\vec{u} = (2, -2, 4), \vec{v} = (-1, 1, -2)$.
   (c) $\vec{u} = (2, 0, 0), \vec{v} = (0, -3, 0)$.
7. Find a normal vector to the plane containing points $P(1, -1, 0), Q(2, 1, -1)$, and $R(-1, 1, 2)$.
8. Find the area of the triangle with vertices $P(1, -1, 0), Q(2, 1, -1)$, and $R(-1, 1, 2)$.
9. Find the equation for the plane containing the points $P(1, -1, 0), Q(2, 1, -1)$, and $R(-1, 1, 2)$.
10. Find an equation for the plane through $A(0, 2, -1)$ and normal to $\vec{n} = (3, -2, -1)$.
11. Find an equation for the plane through the points $A(2, 4, 5), B(1, 5, 7)$, and $C(-1, 6, 8)$.
12. Find the distance from the point $(1, 1, 3)$ to the plane $3x + 2y + 6z = 6$. 

222 Worksheet 18
Topics: More vectors