Name: _____

Problem 1 (15 points)

    a) Show that the vectors $\langle 1,3,2 \rangle$ and $\langle 1,-5,7 \rangle$ are perpendicular.

    b) Find $\mathbf{a} \cdot \mathbf{b}$ if $|\mathbf{a}| = 6$, $|\mathbf{b}| = \sqrt{2}$ and if the angle between $\mathbf{a}$ and $\mathbf{b}$ is $45°$.

    c) Find the angle between $\mathbf{a} = \langle 1,0,-1 \rangle$ and $\mathbf{b} = \langle 0,1,-1 \rangle$.

Problem 2 (5 points)

Suppose a sled of mass 18 lb slides down a hill inclined at an angle of $30°$. If the length of the hill is 100 ft (see figure), what is the work done by the gravitational force?