1. (5 points)
   (a) Find a vector that is orthogonal to both \( \mathbf{a} = 3\mathbf{i} + 2\mathbf{j} + 4\mathbf{k} \) and \( \mathbf{b} = \mathbf{i} - 2\mathbf{j} - 3\mathbf{k} \).

   (b) Verify the orthogonality of the vector that you found in (a) with the vectors \( \mathbf{a} \) and \( \mathbf{b} \).
2. (5 points) A woman exerts a horizontal force of 25 lbs on a crate as she pushes it up a ramp that is 10 feet long and inclined at an angle of 30° above the horizontal. How much work is done?