1. (10 points) Suppose there are two nonzero vectors a, b with angle θ generating a parallelogram with area A, which of the following is equal to $a \cdot b$?

   A. $|a \times b|$ B. A C. $|a||b| \sin\theta$ **D.** $|a||b| \cos\theta$ E. 0 F. $(|a||b|)^2$ G. A^2

2. (25 points) For $a = \langle 3, 0, -1 \rangle$ and $b = \langle -1, 2, 4 \rangle$, compute $a \cdot b$

   Solution: -7

3. (25 points) Find a **unit** vector orthogonal to both the x and the y-axes.

   Solution: $(0, 0, 1)$