

1. (10 points) Suppose there are two nonzero vectors  $a, b$  with angle  $\theta$  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  $a \cdot b$
3. (25 points) Find a **unit** vector orthogonal to both the  $x$  and the  $y$ -axes.