

**Instructions:** Show all work. Use exact answers unless specifically asked to round.

1. Find the dot product of  $\vec{u} = \langle 1, 3, 4 \rangle$ ,  $\vec{v} = \langle 5, -2, -3 \rangle$ .

$$\begin{aligned}\vec{u} \cdot \vec{v} &= 1 \cdot 5 + 3(-2) + 4(-3) = \\ &= 5 - 6 - 12 = \boxed{-13}\end{aligned}$$

2. Sketch the graph of the two vectors in a right-handed coordinate system. Label your axes clearly, and both vectors.

