

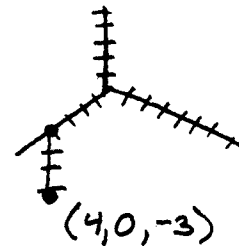
Each problem is worth 5 points, show all work for partial credit.

1. Suppose you start at the origin, move along the x-axis a distance of 4 units in the positive direction, and then move downward a distance of 3 units. What are the coordinates of your position?



$$(4, 0, -3)$$

$$x = 4 \quad y = 0 \quad z = -3$$



2. Find a unit vector that has the same direction as the vector $\langle 9, -5 \rangle$.

$$\langle 9, -5 \rangle$$



$$\sqrt{9^2 - 5^2} = \sqrt{81 + 25} = \sqrt{106} \leftarrow \text{magnitude}$$

Same direction:

$$\left\langle \frac{9}{\sqrt{106}}, -\frac{5}{\sqrt{106}} \right\rangle$$

3. If $\mathbf{a} = \langle 4, -1 \rangle$ and $\mathbf{b} = \langle 3, 6 \rangle$, find $\mathbf{a} \cdot \mathbf{b}$.

vector \cdot vector = scalar
dot product

$$\mathbf{a} = \langle 4, -1 \rangle \quad \mathbf{b} = \langle 3, 6 \rangle$$



$$\langle 4, -1 \rangle \cdot \langle 3, 6 \rangle = 12 - 6 = \boxed{6}$$