

Quiz 1

Key

This is a two-stage quiz. During the first stage, use your knowledge & calculator. You have 15 min. In the second stage, you are now welcome to use your books, notes, and students in the class to retake the same quiz. You have the remainder of the quiz time to write one solution (with everyone's name on it!!!) to be turned in for the group.

1. Consider the set of axes on the right.

(a) [1] Label the positive x , y and z axis.

(+5) follow right hand rule

(b) [1] Plot the point $P(-3, 2, 1)$

(c) [2] Find the distance between P and $Q(0, -3, 2)$.

$$\sqrt{(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2}$$

$$= \sqrt{(0-3)^2 + (-3-2)^2 + (2-1)^2}$$

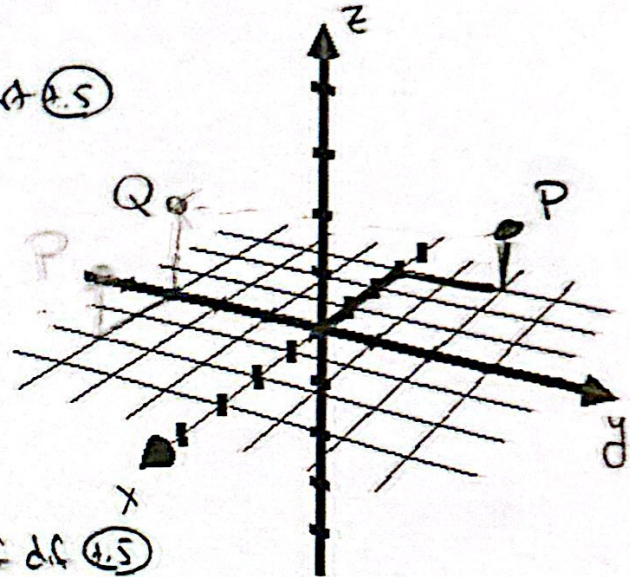
$$= \sqrt{9+25+1} = \sqrt{35}$$

(d) [2] Find the components of $\vec{PQ}$.

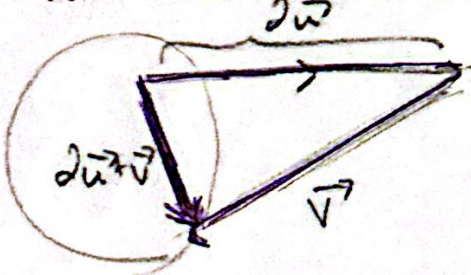
$$\langle 0-3, -3-2, 2-1 \rangle$$

$$= \langle -3, -5, 1 \rangle$$

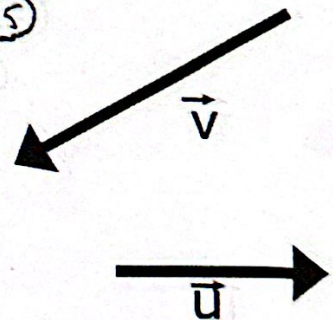
order of diff (+5)
diff (+5)
got it (+1)



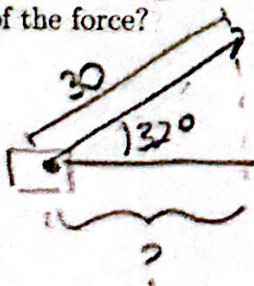
2. [2] Let $\vec{u}$ and $\vec{v}$ be the vectors shown on the right. Sketch $2\vec{u} + \vec{v}$



scale by 2 (+5)
tip to tail (+5)
got it (+1)



3. [2] If Neland is pulling a wagon with a force of 30 Newtons exerted with a handle that makes an angle of 32 degrees above the horizontal, what is the horizontal component of the force?



picture (+5)

Sohcahtoa (+5)

got it (+5)

$$\cos 32^\circ = \frac{?}{30} (+5)$$

$$\Rightarrow ? = 30 \cdot \cos 32^\circ$$

$$\approx 25.44$$