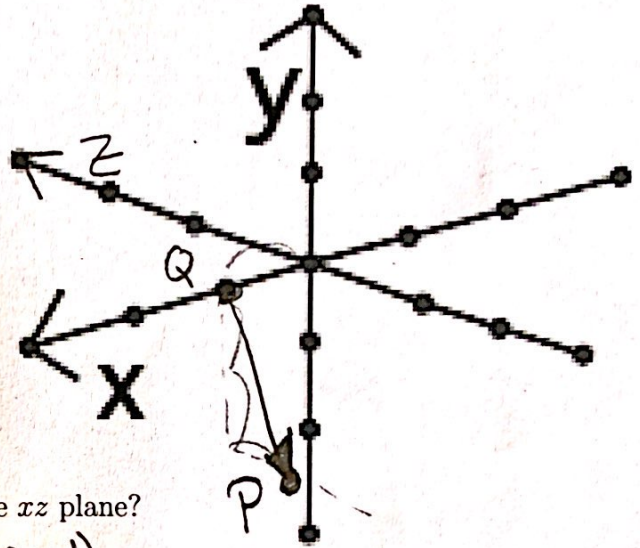


Quiz 1

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 to the right.



(a) [1] Label the positive z axis.

3D activity #1

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

3D activity #2

(c) [1] What is the projection of P on the xz plane?

ie when $y=0$

so $(1, 0, -1)$

web 1/2/21 #2

(d) [1] Find the distance between P and the xz plane?

dist from $P(1, -2, -1)$ to $(1, 0, -1)$

really Δy or 2 units

$$\text{OR formula } \sqrt{\Delta x^2 + \Delta y^2 + \Delta z^2} = \sqrt{(1-1)^2 + (-2-0)^2 + (-1-(-1))^2} = 2$$

web 1/2/21 #4

(e) [2] Let $Q(1, 0, 0)$. Draw the vector \vec{QP}

arrow direction (+) plot Q correctly (+) connect P & Q (+)

plot Q correctly (+) connect P & Q (+)

(f) [2] Find the components of \vec{QP} .

$$\langle \Delta x, \Delta y, \Delta z \rangle = \langle (1-1), (-2-0), (-1-0) \rangle = \langle 0, -2, -1 \rangle$$

diff of coord (+)

notation (+)

pt P-Q coord (+)

start (+)

web 1/2/21 #3

(g) [2] Let $\vec{a} = 3\vec{j} - 2\vec{k}$. Find the components of $2\vec{a} + \vec{QP}$

$$\vec{a} = 3\vec{j} - 2\vec{k} = 3\langle 0, 1, 0 \rangle - 2\langle 0, 0, 1 \rangle$$

unpack $\vec{i} + \vec{j} + \vec{k}$ (+)

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

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

comp. of \vec{a} (+)

$$2\vec{a} + \vec{QP} = 2\langle 0, 3, -2 \rangle + \langle 0, -2, -1 \rangle$$

$$= \langle 0, 6, -4 \rangle + \langle 0, -2, -1 \rangle$$

$$= \langle 0, 4, -5 \rangle$$

web 1/2/21 #6