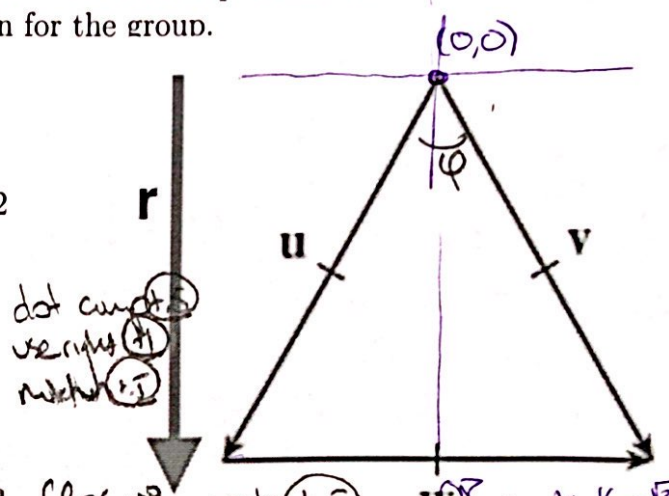


Key

Quiz 2

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 vectors shown on the right. Assume that \vec{r} , \vec{u} , \vec{v} , and \vec{w} all have length 2 and are in the xy plane inside 3 dimensions.



(a) [2] Find $\vec{r} \cdot \vec{w}$ *note $\vec{r} \perp \vec{w}$*
 $= \|\vec{r}\| \|\vec{w}\| \cos 90^\circ$
 $= 0$

dot product
use right (+1)
note that (+1)

(b) [2] Find $\vec{u} \cdot \vec{v}$ *use equilateral $\Delta \Rightarrow \theta = 60^\circ$*
 $= \|\vec{u}\| \|\vec{v}\| \cos 60^\circ$
 $= 2 \cdot 2 \cdot \frac{1}{2} = 2$

angle (+1.5)
use dot prod right (+1)
note that (+1.5)
or $u = 2(\frac{1}{2}, -\frac{\sqrt{3}}{2})$
 $v = 2(\frac{1}{2}, \frac{\sqrt{3}}{2})$

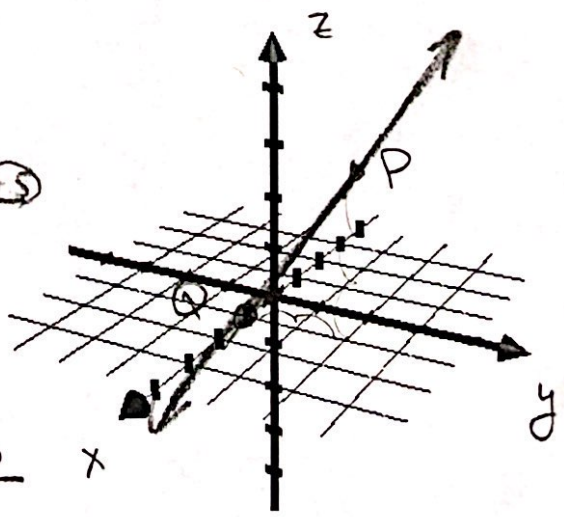
(c) [2] Find $\|\vec{u} \times \vec{v}\|$
 $= \|\vec{u}\| \|\vec{v}\| \sin 60^\circ$
 $= 2 \cdot 2 \cdot \frac{\sqrt{3}}{2}$
 $= 2\sqrt{3} \approx 3.46$

cross prod dot (+1.5)
used cross right (+1)
got it (+1.5)

or $\vec{u} \cdot \vec{v} = (1)(1) + (-\sqrt{3})(\sqrt{3})$
 $= 1 - 3 = -2$

2. Consider the points $P(1, 2, 3)$ and $Q(1, 0, 0)$.

(a) [1] Label the positive x , y , and z axis and then sketch the line.
 (b) [3] Find an equation for the line passing through P and Q .



so many right answers?
 (5) Looking for $\vec{r} = \vec{r}_0 + t\vec{v}$
 $\vec{v} = \text{direction vector}$
 $= P - Q$
 $= \langle 0, 2, 3 \rangle$
 thru $(1, 0, 0) = \vec{r}_0$ so
 $\langle x, y, z \rangle = \langle 1, 0, 0 \rangle + t \langle 0, 2, 3 \rangle$
 where $t \in \mathbb{R}$

or