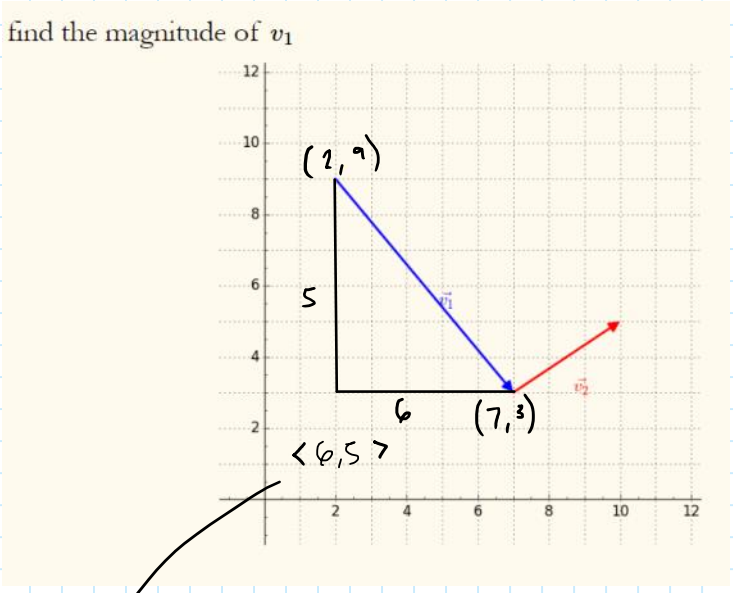
Q1

Sunday, May 17, 2020 2:40 PM

find the magnitude of v_1



$$\|v_1\| = \sqrt{5^2 + 6^2}$$

$$= \sqrt{25 + 36}$$

$$\|v_1\| = \sqrt{61}$$

B) $\|v_1\| = \sqrt{61}$

Q2

Sunday, May 17, 2020 3:18 PM

$$< 9, 5, -1 > \cdot < 1, 7 >$$

$<9, 5, -1> \cdot <1, 7>$

missing another value

F) None of these

Q3

Sunday, May 17, 2020 3:20 PM

A 'distance' between vectors $\vec{v}$ and $\vec{w}$ is

$$(\vec{v} - \vec{w}) \cdot (\vec{v} - \vec{w})$$

Distance by DOT

$$\|\vec{w} - \vec{v}\|^2 = (\vec{w} - \vec{v}) \cdot (\vec{w} - \vec{v})$$

$$\|\vec{w} - \vec{v}\| = \sqrt{(\vec{w} - \vec{v}) \cdot (\vec{w} - \vec{v})}$$

B) False

Q4

Sunday, May 17, 2020 3:24 PM

$$< -6, 8, 6 > + < 9, 3, -1 >$$

$\langle -6, 8, 6 \rangle + \langle 9, 3, -1 \rangle$

$= \langle 3, 11, 5 \rangle$

c) $\langle 3, 11, 5 \rangle$

Q5

Sunday, May 17, 2020 3:55 PM

The cosine of the angle between two (non-zero) vectors of the same dimension, $\vec{v}$ and $\vec{w}$ is

$$\cos(\theta) = \frac{\vec{v} \cdot \vec{w}}{\|\vec{v}\| \cdot \|\vec{w}\|}$$

A) $\cos\theta = \dfrac{\vec{v} \cdot \vec{w}}{\|\vec{v}\| \cdot \|\vec{w}\|}$

Q6

Sunday, May 17, 2020 4:10 PM

the normalized vector for $\vec{v}$

$N_{\vec{v}}$

has which characteristics?

A) $N_{\vec{v}}$ has the same direction as $\vec{v}$

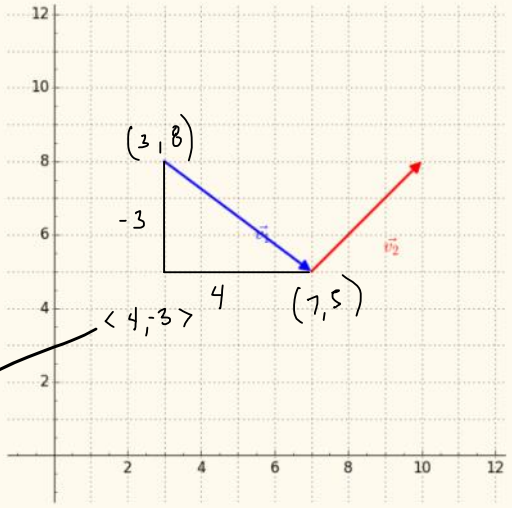
C) $N_{\vec{v}}$ has magnitude equal to 1

D) $N_{\vec{v}}$ can be computed as $\frac{1}{\|\vec{v}\|}\vec{v}$

Q7

Sunday, May 17, 2020 4:29 PM

find the normalized version of v_1



$$N_{\vec{v}} = \frac{1}{\|\vec{v}\|}\vec{v}$$

$$\|\vec{v}_1\| = \sqrt{4^2 + (3)^2}$$
$$= \sqrt{16 + 9}$$
$$= \sqrt{25}$$
$$= 5$$

$$\frac{1}{5} < 4, -3 >$$

$$= < \frac{4}{5}, -\frac{3}{5} >$$

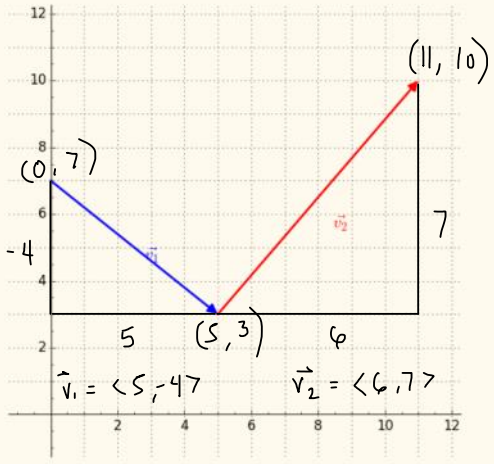
A) $\|N_{v_1}\| = \langle \frac{4}{5}, -\frac{3}{5} \rangle$

Q8

Sunday, May 17, 2020 6:00 PM

compute the following

$$-2 \cdot v_1 + 3 \cdot v_2$$



$-2 \cdot \vec{v}_1 + 3 \cdot \vec{v}_2$

$= -2\langle 5, -4 \rangle + 3\langle 6, 7 \rangle$

$= \langle -10, 8 \rangle + \langle 18, 21 \rangle$

$= \langle 8, 29 \rangle$

c) $\langle 8, 29 \rangle$

Q9

Sunday, May 17, 2020 6:29 PM

$$< 1, -1 > + < 5, -4 >$$

$\langle 1, -1 \rangle + \langle 5, -4 \rangle$

$= \langle 6, -5 \rangle$

d) $\langle 6, -5 \rangle$

Q10

Sunday, May 17, 2020 6:31 PM

assume vectors are of same size.

$$\vec{v} \cdot \vec{w} = \vec{w} \cdot \vec{v}$$

B) True

Q11

Sunday, May 17, 2020 6:32 PM

$$\vec{v} \cdot \vec{v} = ||\vec{v}||$$

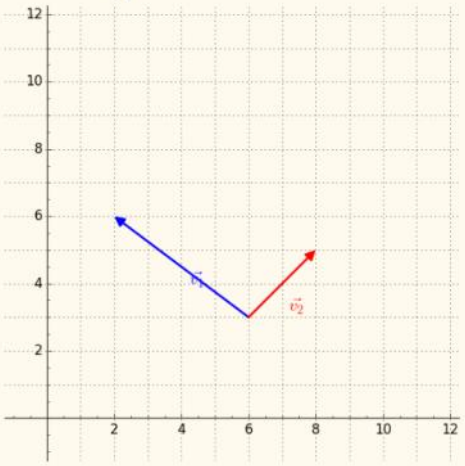
$\|\vec{v}\|^2 = \vec{v} \cdot \vec{v}$

b) False

Q12

Sunday, May 17, 2020 6:33 PM

compute the projection $proj_{\vec{v_1}}\vec{v_2}$ where $\vec{v_2} = (2, 2)$ and $\vec{v_1} = (-4, 3)$



$\vec{v}_1 = \langle -4, 3 \rangle$

$\vec{v}_2 = \langle 2, 2 \rangle$

$$proj_{\vec{w}}\vec{v} = \frac{\vec{v}\cdot\vec{w}}{\|\vec{w}\|\|\vec{w}\|}\cdot\vec{w}$$

$$proj_{\vec{v}_1}\vec{v}_2 = \frac{\vec{v}_2\cdot\vec{v}_1}{\|\vec{v}_1\|\|\vec{v}_1\|}\vec{v}_1$$

$$= \frac{\langle 2,2\rangle\cdot\langle -4,3\rangle}{5\cdot 5}\langle -4,3\rangle$$

$$= \frac{-8+6}{25}\langle -4,3\rangle$$

$$= \frac{-2}{25}\langle -4,3\rangle$$

$$proj_{\vec{v}_1}\vec{v}_2 = \left\langle \frac{8}{25}, \frac{-6}{25} \right\rangle$$

$$\|\vec{v}_1\| = \sqrt{(-4)^2 + 3^2}$$

$$= \sqrt{16+9}$$

$$= \sqrt{25}$$

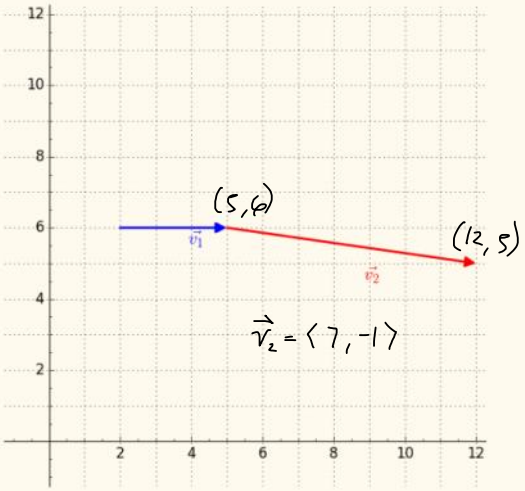
$$\|\vec{v}_1\| = 5$$

B) $proj_{\vec{v}_1}\vec{v}_2 = \left(\frac{8}{25}, -\frac{6}{25}\right)$

Q13

Sunday, May 17, 2020 6:47 PM

compute the product of the scalar and the vector $5 \cdot v_2$



$5 \cdot \vec{v}_2 = 5\langle 7, -1 \rangle$

$5 \cdot \vec{v}_2 = \langle 35, -5 \rangle$

B) $5 \cdot v_2 = \langle 35, -5 \rangle$

Q14

Sunday, May 17, 2020 6:52 PM

A 'distance' between vectors $\vec{v}$ and $\vec{w}$ is

$$\sqrt{(\vec{v}-\vec{w})\cdot(\vec{v}-\vec{w})}$$

A) True

Q15

Sunday, May 17, 2020 6:53 PM

$$< 0, -6, 6 > + < 5, 3 >$$

D) None of these

Q16

Sunday, May 17, 2020 6:54 PM

assume vectors are non-zero and of same size.

$$\vec{v} \perp \vec{w}$$

if and only if

$$\vec{v} \cdot \vec{w} = 0$$

B) True

Q17

Sunday, May 17, 2020 6:56 PM

assume vectors are of same size, assume k is a real constant.

$$k(\vec{v} \cdot \vec{w}) = k\vec{v} \cdot k\vec{w}$$

$(u + w) \cdot v = u \cdot v + w \cdot v$

A) False

Q18

Sunday, May 17, 2020 7:04 PM

Assume the two vectors of the same dimension, which is the projection of $\vec{w}$ onto $\vec{v}$

B) $\text{proj}_{\vec{v}} \vec{w} = \frac{\vec{v} \cdot \vec{w}}{\|\vec{v}\|^2} \cdot \vec{v}$

Q19

Sunday, May 17, 2020 7:08 PM

$$< 7, -2, 9 > \cdot < 5, -1, -6 >$$

$\langle 7, -2, 9 \rangle \cdot \langle 5, -1, -6 \rangle$

$= 35 + 2 - 54$

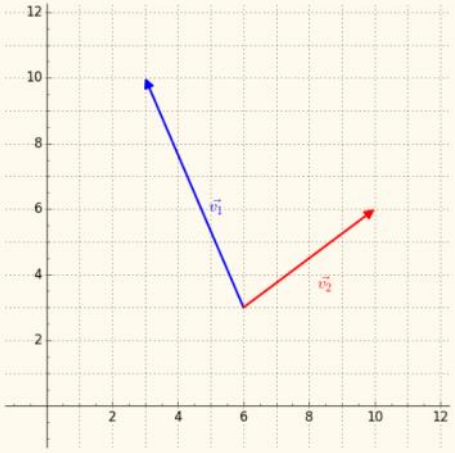
$= -17$

F) -17

Q20

Sunday, May 17, 2020 7:12 PM

compute the dot product $\vec{v_1} \cdot \vec{v_2}$ where $\vec{v_2} = (4, 3)$ and $\vec{v_1} = (-3, 7)$



$\vec{v}_1 = \langle -3, 7 \rangle$

$\vec{v}_2 = \langle 4, 3 \rangle$

$\langle -3, 7 \rangle \cdot \langle 4, 3 \rangle$

$= -12 + 21$

$= 9$

*) 9

Q21

Sunday, May 17, 2020 7:17 PM

Assume the two vectors of the same dimension, which is the projection of $\vec{w}$ onto $\vec{v}$

D) $\text{proj}_{\vec{v}} \vec{w} = \frac{\vec{v} \cdot \vec{w}}{\|\vec{v}\|^2} \cdot \vec{v}$

Q22

Sunday, May 17, 2020 7:19 PM

$$< 7, 9, -5 > \cdot < -3, -2, 10 >$$

$\langle 7,9,-5\rangle \cdot \langle -3,-2,10\rangle$

$= -21, -18, -50$

$= -89$

A) -89

Q23

Sunday, May 17, 2020 7:21 PM

assume vectors are of same size, assume k is a real constant.

$$k(\vec{v} \cdot \vec{w}) = k\vec{v} \cdot \vec{w}$$

~~A) False~~

B) True

Q24

Sunday, May 17, 2020 7:23 PM

$$\vec{v} \cdot \vec{v} = ||\vec{v}||^2$$

B) True

Q25

Sunday, May 17, 2020 7:24 PM

Assume the two vectors of the same dimension, which is the projection of $\vec{w}$ onto $\vec{v}$

E) None of these