

Precalculus with Limits
Practice 1
Vectors

Name Solutions

Period _____

1.

a) Write \mathbf{u} in component form?

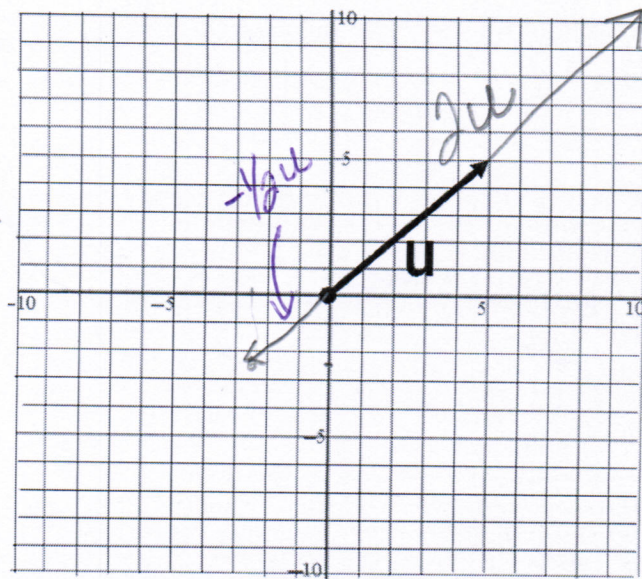
$$\langle 5, 5 \rangle$$

b) What is the magnitude of \mathbf{u} ?

$$\|\mathbf{u}\| = \sqrt{25+25} = \sqrt{50} = 5\sqrt{2}$$

c) Draw $2\mathbf{u}$.

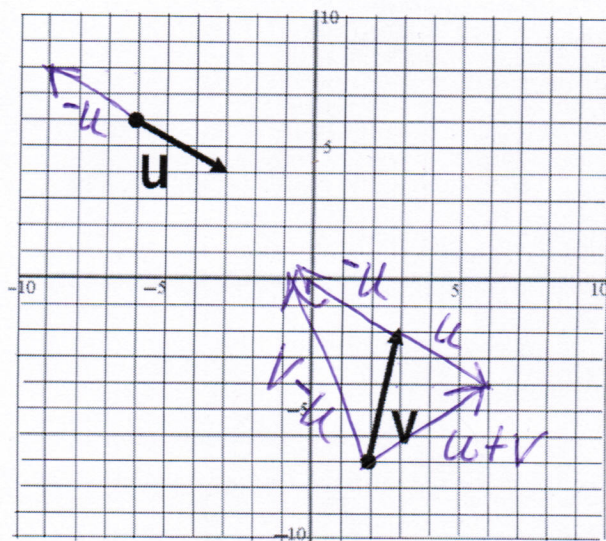
d) Draw $-\frac{1}{2}\mathbf{u}$



2.

a) Draw $\mathbf{u} + \mathbf{v}$

b) Draw $\mathbf{v} - \mathbf{u}$



3.

$$u = \langle 3, -2 \rangle \quad v = \langle 1, 5 \rangle$$

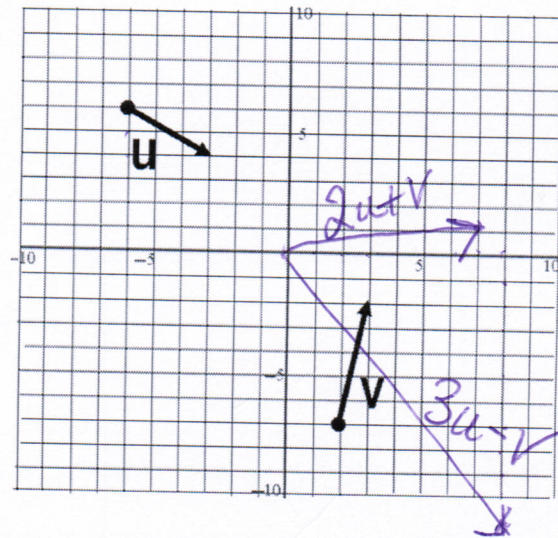
a) Draw $2u + v$

$$2u = \langle 6, -4 \rangle \quad 2u + v = \langle 7, 1 \rangle$$

b) Draw $3u - v$

$$3u = \langle 9, -6 \rangle \quad 3u - v = \langle 8, -11 \rangle$$

c) Write the vector $4v + 3u$ as a sum of unit vectors i and j .

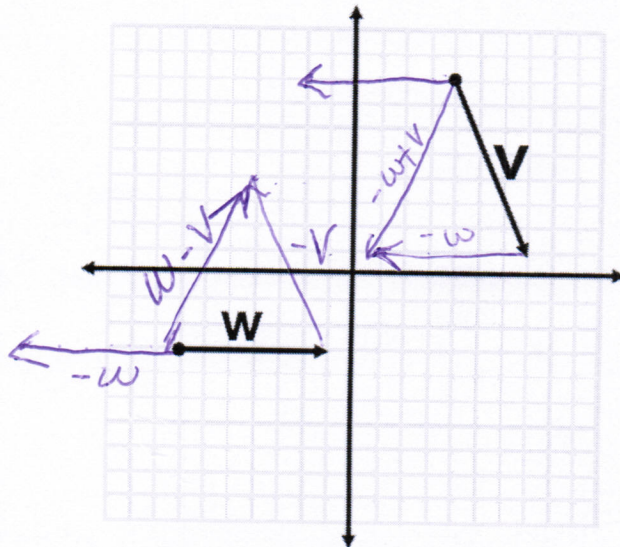


4.

a) Draw $-w + v$

b) Draw $w - v$

c) Write $w - v$ as a sum of unit vectors i and j .



5.

a) Draw $-w + v$

b) Draw $w - v$

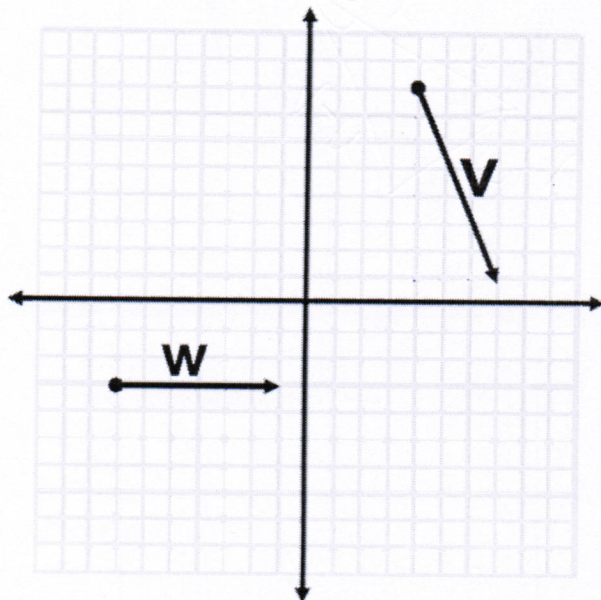
Same
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c) What is the magnitude of v ?

$$\|v\| = \sqrt{49 + 9} = \sqrt{58}$$

d) What is the magnitude of w ?

$$\|w\| = 6$$



6. Consider the vector seen in the diagram.

a) Write the vector \vec{u} in component form.

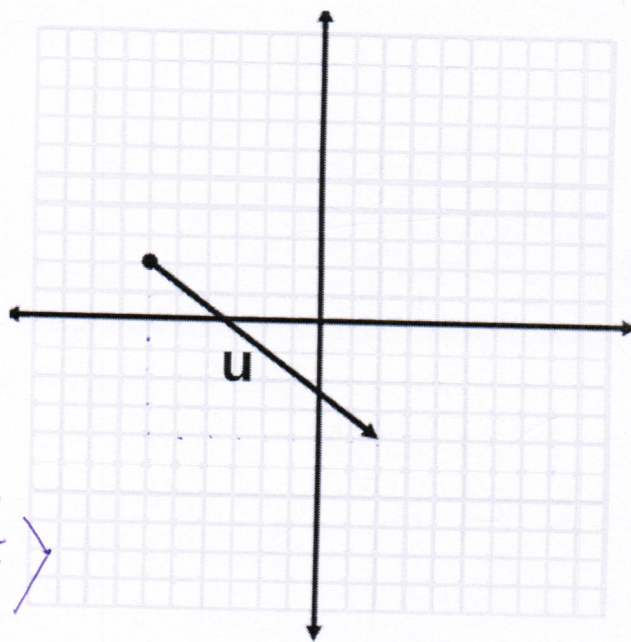
$$u = \langle 8, -6 \rangle$$

b) Compute $\|\vec{u}\|$

$$\|\vec{u}\| = \sqrt{64 + 36} = \sqrt{100} = 10$$

c) Write a unit vector, \mathbf{v} , in component form that is in the same direction as \vec{u} .

$$v = \left\langle \frac{8}{10}, -\frac{6}{10} \right\rangle = \left\langle \frac{4}{5}, -\frac{3}{5} \right\rangle$$



7. Write a unit vector, \mathbf{u} , in component form that is in the same direction as the vector $\vec{v} = -3\mathbf{i} + 9\mathbf{j}$.

$$\|\vec{v}\| = \sqrt{9 + 27} = \sqrt{36} = 6$$

$$u = \frac{1}{6} \vec{v} = \left\langle -\frac{3}{6}, \frac{9}{6} \right\rangle = -\frac{1}{2}\mathbf{i} + \frac{3}{2}\mathbf{j}$$

8. Write a unit vector, \mathbf{u} , in component form that is in the same direction as the vector $\vec{v} = \langle 5, -7 \rangle$.

$$\|\vec{v}\| = \sqrt{25 + 49} = \sqrt{74}$$

$$u = \left\langle \frac{5}{\sqrt{74}}, -\frac{7}{\sqrt{74}} \right\rangle$$