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Course: CA&T Internet (70263)
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Assignment: 7.4 Vectors

1. Complete the following statement.

A vector is a quantity that is characterized by a magnitude and a(n) _____.

A vector is a quantity that is characterized by a magnitude and a(n) direction.

2. The vector sum $\mathbf{v} + \mathbf{w}$ is represented by the diagonal of the _____ with adjacent sides \mathbf{v} and \mathbf{w} .

The vector sum $\mathbf{v} + \mathbf{w}$ is represented by the diagonal of the parallelogram with adjacent sides \mathbf{v} and \mathbf{w} .

3. Decide whether the following statement is true or false.

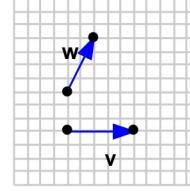
The zero vector $\mathbf{0}$ is the only vector with no direction specified.

Choose the correct answer below.

- False
 True

4. Use the vectors in the figure at the right to graph the following vector.

$\mathbf{v} + \mathbf{w}$



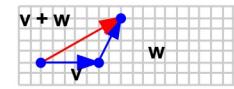
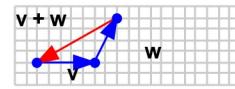
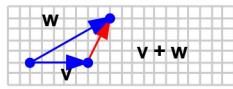
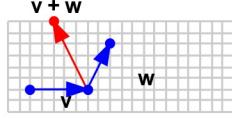
Choose the correct graph below.

A.

B.

C.

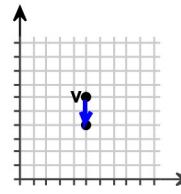
D.



- 5.

Use the vector in the figure at the right to graph the following vector.

$3\mathbf{v}$



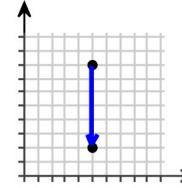
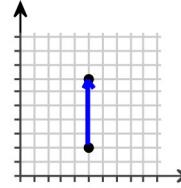
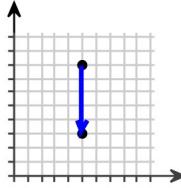
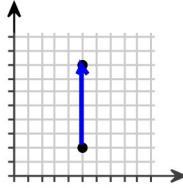
Select the figure with the vector $3\mathbf{v}$.

A.

B.

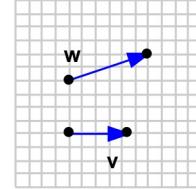
C.

D.



6. Use the vectors in the figure at the right to graph the following vector.

$$2\mathbf{v} - \mathbf{w}$$



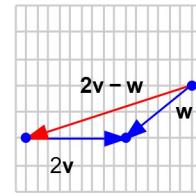
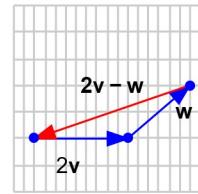
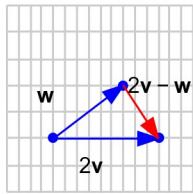
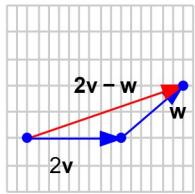
Choose the correct graph below.

A.

B.

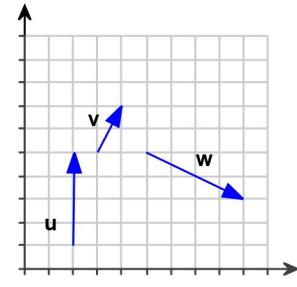
C.

D.



7.

- Use the vectors \mathbf{u} , \mathbf{v} , and \mathbf{w} in the accompanying figure to graph the vector $\mathbf{u} + \mathbf{v} + \mathbf{w}$.



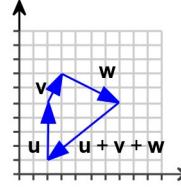
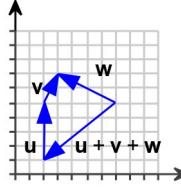
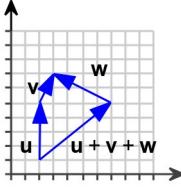
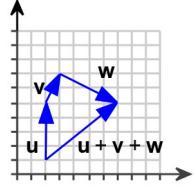
Choose the correct graph below.

A.

B.

C.

D.



8. Watch the video and then solve the problem below.

[Click here to watch the video.¹](#)

Let \mathbf{v} be the vector with initial point $P(-5,8)$ and terminal point $Q(-1,-3)$. Write \mathbf{v} as a position vector,

Choose the correct answer below.

A. $\langle 4,5 \rangle$

B. $\langle -4,5 \rangle$

C. $\langle 4,-11 \rangle$

D. $\langle -4,-11 \rangle$

1: http://mediaplayer.pearsoncmg.com/assets/Dt_yEINKipQL_O5up75DRHqLs_qnCHR?clip=2

9. The vector \mathbf{v} has initial point P and terminal point Q . Write \mathbf{v} as a position vector.

$$P(7,3), Q(5,7)$$

$$\mathbf{v} = \langle \quad -2 \quad , \quad 4 \quad \rangle$$

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

10. The vector \mathbf{v} has initial point P and terminal point Q . Write \mathbf{v} as a position vector.

$$P(-8,-2), Q(-6,-9)$$

$$\mathbf{v} = \langle \quad 2 \quad , \quad -7 \quad \rangle$$

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

11. For the points $A(-4, -1)$, $B(-5, 3)$, $C(0, -2)$, and $D(1, -6)$, determine whether the vectors \overrightarrow{AB} and \overrightarrow{CD} are equivalent.
[Hint: Write \overrightarrow{AB} and \overrightarrow{CD} as position vectors.]

Choose the correct answer below.

- A. The vectors are not equivalent because the position vector of \overrightarrow{AB} is not equal to the position vector of \overrightarrow{CD} .
- B. The vectors are equivalent because the position vector of \overrightarrow{AB} is equal to the position vector of \overrightarrow{CD} .
- C. The vectors are equivalent because the position vector of \overrightarrow{AB} is a scalar multiple of the position vector of \overrightarrow{CD} .
- D. The vectors are not equivalent because the position vector of \overrightarrow{AB} and the position vector of \overrightarrow{CD} are located in different positions.

12. Let $\mathbf{v} = \langle -2, 1 \rangle$. Find $\|\mathbf{v}\|$.

$$\|\mathbf{v}\| = \sqrt{5}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

13. Let $\mathbf{v} = \langle -1, 3 \rangle$ and $\mathbf{w} = \langle 7, -5 \rangle$. Find $\mathbf{v} - \mathbf{w}$.

$$\mathbf{v} - \mathbf{w} = \langle -8, 8 \rangle$$

(Simplify your answers.)

14. Let $\mathbf{u} = 2\mathbf{i} - 2\mathbf{j}$ and $\mathbf{v} = -3\mathbf{i} + 4\mathbf{j}$. Find the vector $\mathbf{u} + \mathbf{v}$.

$$\mathbf{u} + \mathbf{v} = -1\mathbf{i} + 2\mathbf{j}$$
 (Simplify your answer. Type your answer in terms of \mathbf{i} and \mathbf{j} .)

15. Let $\mathbf{v} = -8\mathbf{i} + 9\mathbf{j}$ and $\mathbf{w} = -\mathbf{i} - 7\mathbf{j}$. Find $4\mathbf{v} - 8\mathbf{w}$.

$$4\mathbf{v} - 8\mathbf{w} = -24\mathbf{i} + 92\mathbf{j}$$
 (Simplify your answer. Type your answer in terms of \mathbf{i} and \mathbf{j} .)

16. Find the magnitude and bearing of the resultant \mathbf{R} of two forces \mathbf{F}_1 and \mathbf{F}_2 , where \mathbf{F}_1 is a force of 23 pounds acting due south and \mathbf{F}_2 is a force of 34 pounds acting due west.

The magnitude of the resultant \mathbf{R} is 41 pounds.

(Round to the nearest tenth as needed.)

The bearing of the resultant \mathbf{R} is S 55.9 ° W.

(Round to the nearest tenth as needed.)