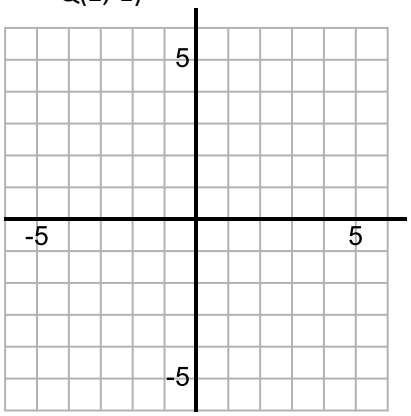
Name_____Review for Quiz 2-6-19 Basics of Vectors and Vector Operations

Given P(-1,2)
Q(2,-1)



1. State the direction of this vector in all three forms if we are travelling from P to Q

$$\begin{bmatrix} \quad \\ \quad \end{bmatrix} = \langle \quad , \quad \rangle = \_\_\_\_ i + \_\_\_\_ j$$

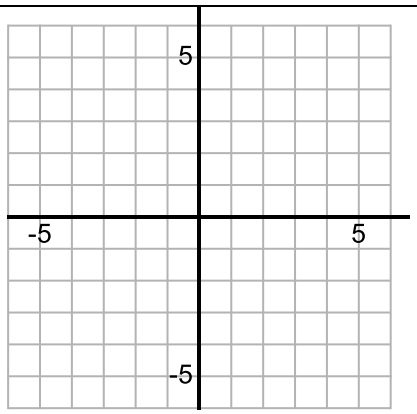
2. State the exact magnitude of this vector

3. State the unit vector related to this vector PQ

4. Determine a vector in the opposite direction as vector PQ with length 5 units

5. Determine a vector in the same direction as vector PQ with quadruple the magnitude

6. Vector AB is parallel to PQ with same magnitude. Determine the location(s) for A if B is (6,0)

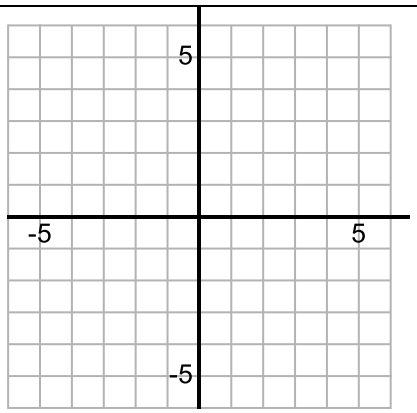


Given $\vec{a} = \begin{bmatrix} -1 \\ 2 \end{bmatrix}$ and $\vec{b} = \begin{bmatrix} -3 \\ -1 \end{bmatrix}$

7. Draw the resultant vector a + b and its associated vector triangle

8. State the resultant vector's direction vector in all three forms

$$\begin{bmatrix} \quad \\ \quad \end{bmatrix} = \langle \quad , \quad \rangle = \_\_\_\_ i + \_\_\_\_ j$$



Given $\vec{a} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$ and $\vec{b} = \begin{bmatrix} 3 \\ -1 \end{bmatrix}$

9. Draw the resultant vector a-b and its associated vector triangle

10. State the resultant vector's direction vector in all three forms

$$\begin{bmatrix} \quad \\ \quad \end{bmatrix} = \langle \quad , \quad \rangle = \_\_\_\_ i + \_\_\_\_ j$$

11. If a pair of vectors forms a right angle, then its related dot product is _____

12. If a pair of vectors forms an obtuse angle, then its related dot product is _____

13. If a pair of vectors forms a acute angle, then its related dot product is _____

Determine the angle formed by two direction vectors with the same initial point $\cos\theta = \frac{a \bullet b}{|a||b|}$

Vector a = 2i+5j Vector b = -8i +10j Vector c = -8i -10j Vector d = -0.4i -1j

14. Determine the smallest angle formed between vector a and vector b

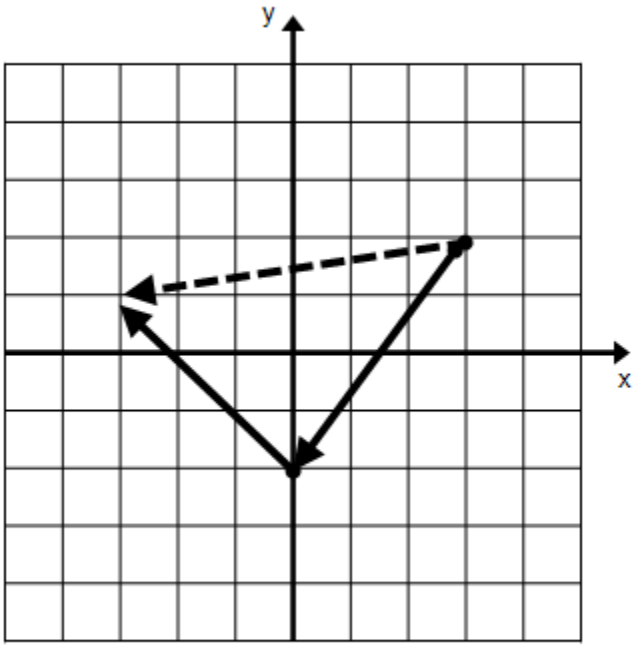
15. Determine the smallest angle formed between vector b and vector c

16. Determine the smallest angle formed between vector b and vector d

17. Which of these vectors are parallel to each other?

Vector a = 3i+6j Vector b = -8i + 4j Vector c = 12i +6j Vector d = -0.6i -1.2j

18. Explain how you can determine if vectors are parallel



This is a vector triangle with the vector equation
Vector a +Vector b = Vector c

19. Which of the vectors is the resultant vector?
    a. Vector a
    b. Vector b
    c. Vector c
    d. None of these

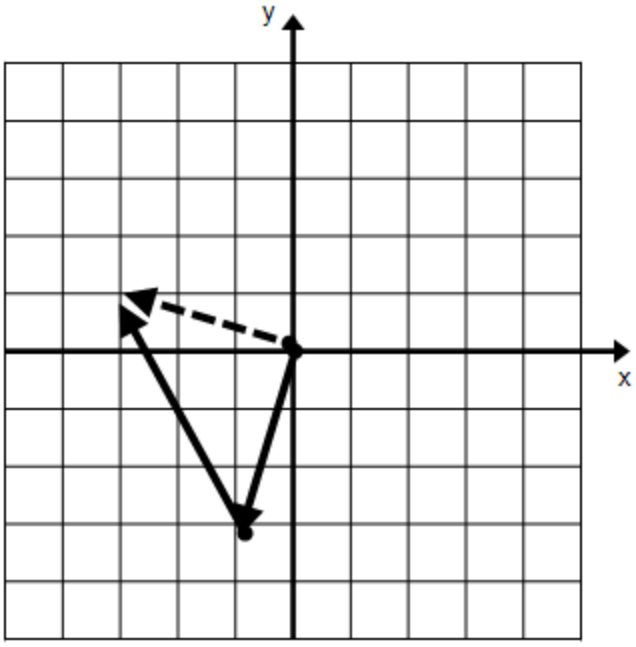
20. What is the magnitude of Vector a?

21. What is the unit vector of Vector b?

22. What is the direction vector of each of the vectors

    Vector a = < , > Vector b < , >

    Vector c = < , >



This is a vector triangle with the vector equation
Vector d -Vector g = Vector f

23. Which of the vectors is the resultant vector?
    a. Vector d
    b. Vector f
    c. Vector g
    d. None of these

24. What is the magnitude of Vector g?

25. What is the i and j form of direction Vector f?

26. What is the direction vector of each of the vectors

    Vector d = < , > Vector f < , >

    Vector g = < , >

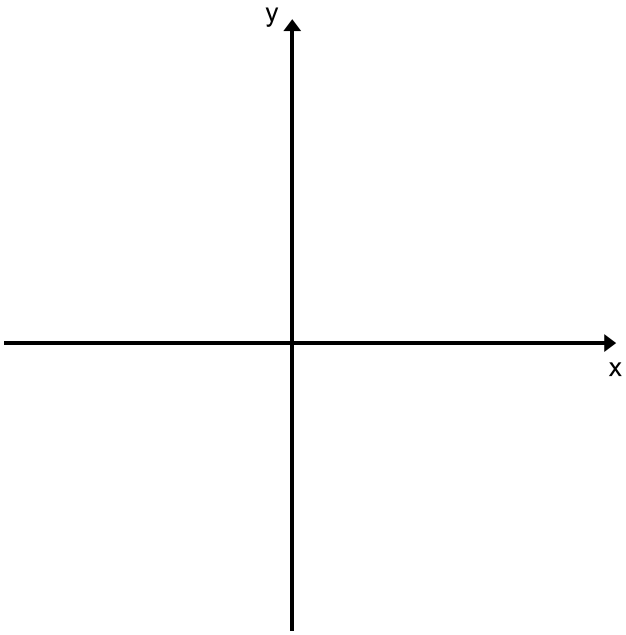
An airplane has a bearing of N 82°W with a speed of 400 mph. The wind is blowing with a bearing of S70°W with a speed of 10 mph

27. Sketch all three vectors on the grid provided

28. Determine the ground speed of the resultant vector.

29. Give the direction of the resultant vector using bearing notation.

30. Give the direction of the resultant vector using any other method



Show work for speed (magnitude) of resultant vector here

Show work for direction of the resultant vector here