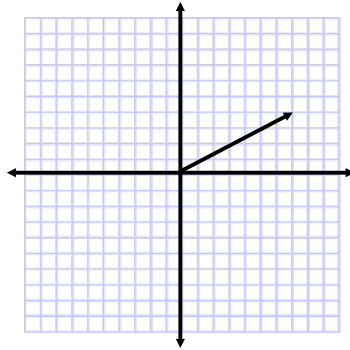
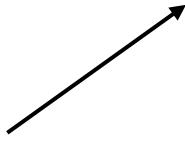


Write your questions
and thoughts here!

BIG IDEA

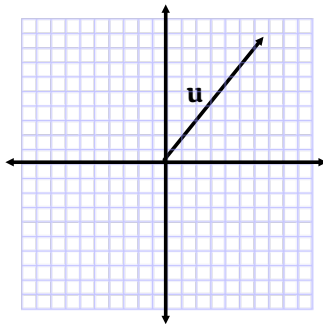
Vector:Magnitude:

$$\mathbf{v} = \vec{v} = \langle a, b \rangle$$

Components

$$\mathbf{v} = \langle 7, 4 \rangle$$

$$\text{Magnitude} = \|\mathbf{v}\| =$$

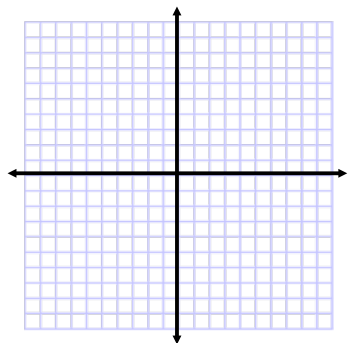
Ex 1: Find the magnitude: $\langle -4, 8 \rangle$ Ex 2: Find the components of the vector, \mathbf{u} .

$$\|\mathbf{u}\| = 15, \theta = 60^\circ$$

Ex 3: Find the components of the vector, \mathbf{v} .

$$\|\mathbf{v}\| = 6, \theta = 160^\circ$$

SCALAR MULTIPLICATION



$$s\langle a, b \rangle = \langle sa, sb \rangle$$

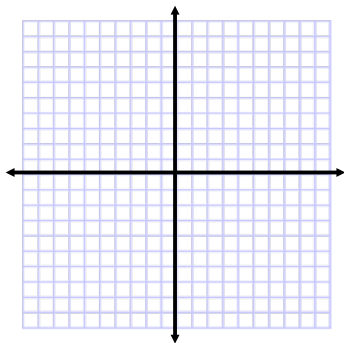
Ex 4. Multiply by the scalar, draw both vectors and compare.

a. $2\langle 3, -2 \rangle$

b. $-2\langle 3, -2 \rangle$

What happens with the direction of the vector when you multiply by a scalar?

Write your questions and thoughts here!



Vector Addition

$$\langle a_1, b_1 \rangle + \langle a_2, b_2 \rangle = \langle a_1 + a_2, b_1 + b_2 \rangle$$

Graphically, we align the vectors Tip to Tail and find the result.

Ex 5: $\langle 3, -2 \rangle + \langle 2, 5 \rangle$

Algebraically:

Graphically:

YOU TRY!

1) $\mathbf{u} = \langle 4, 2 \rangle, \mathbf{v} = \langle -3, 5 \rangle$

a. Find $\|\mathbf{u}\|$

b. Find $2\mathbf{u} - 3$

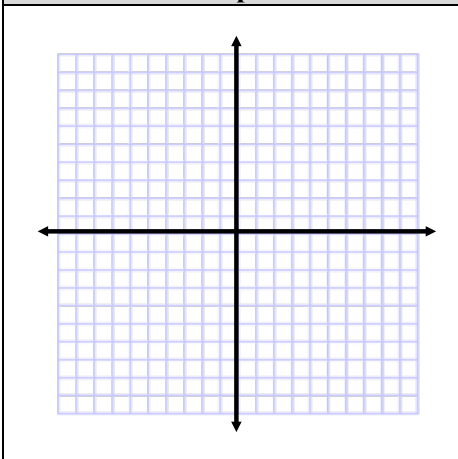
2) Find the components to the vector with $\|\mathbf{v}\| = 10, \theta = 220^\circ$

4.8A Vectors

AP Precalculus

4.8A Practice

Instructions: Graph each vector from the origin. Find the magnitude.



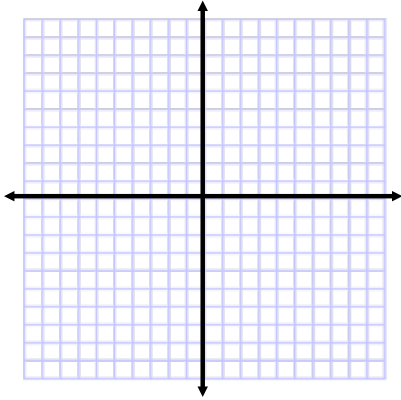
	1) $\langle -5, 2 \rangle$
	2) $\langle 6, -3 \rangle$
	3) $\langle -3, -5 \rangle$

Directions: Find the components of the vector given the magnitude and direction.

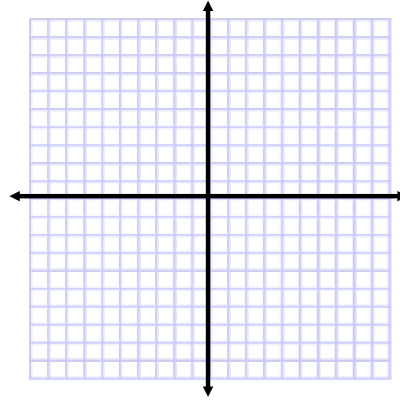
4) $\ \mathbf{v}\ = 4, \theta = 20^\circ$	5) $\ \mathbf{w}\ = 18, \theta = 300^\circ$	6) $\ \mathbf{u}\ = 7, \theta = 115^\circ$
--------------------------------------------	----------------------------------------------	---------------------------------------------

Directions: Add the vectors graphically and find the resulting vector.

7) $\langle -5, 2 \rangle + \langle 9, -5 \rangle$



8) $\langle 7, 4 \rangle + \langle -8, -2 \rangle$



Directions: Use the following vectors to simplify the following expressions.

$\mathbf{u} = \langle 3, 2 \rangle, \mathbf{v} = \langle -5, 7 \rangle, \mathbf{w} = \langle -4, -9 \rangle$

9) $2\mathbf{u} - \mathbf{w}$

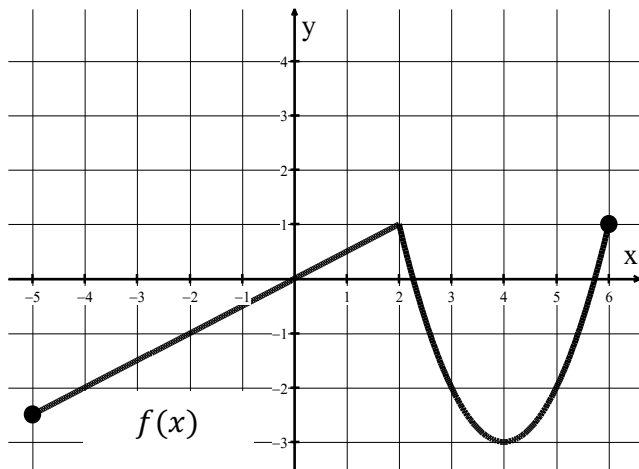
10) $3\mathbf{w} + 2\mathbf{v} - \mathbf{u}$

11) $\mathbf{u} + 4\mathbf{v} - 5\mathbf{v}$

4.8A Vectors

4.8A Test Prep

- 12) A continuous function f is defined on the closed interval $-5 < x < 6$ and is shown in the graph below. For how many values of b , $-5 < b < 6$, is the average rate of change of f on the interval $[b, 5]$ equal to 0? Give a reason for your answer.



- 13) **No calculator allowed!** The polynomial function g is given by $g(x) = (x - 6)(x^2 + 2x + 2)$. Which of the following describes the zeros of g ?
- (A) g has exactly two distinct real zeros.
 - (B) g has exactly three distinct real zeros.
 - (C) g has exactly one distinct real zero and no non-real zeros.
 - (D) g has exactly one distinct real zero and two non-real zeros.

14. The following polynomial function f is given by $f(x) = -7x^6 + 2x^2 + 4$. Which of the following statements about the end behavior of f is true?

- (A) The sign of the leading term of f is positive, and the degree of the leading term of f is even; therefore, $\lim_{x \rightarrow -\infty} f(x) = \infty$ and $\lim_{x \rightarrow \infty} f(x) = \infty$.
- (B) The sign of the leading term of f is negative, and the degree of the leading term of f is odd; therefore, $\lim_{x \rightarrow -\infty} f(x) = \infty$ and $\lim_{x \rightarrow \infty} f(x) = -\infty$.
- (C) The sign of the leading term of f is positive, and the degree of the leading term of f is odd; therefore, $\lim_{x \rightarrow -\infty} f(x) = -\infty$ and $\lim_{x \rightarrow \infty} f(x) = \infty$.
- (D) The sign of the leading term of f is negative, and the degree of the leading term of f is even; therefore, $\lim_{x \rightarrow -\infty} f(x) = -\infty$ and $\lim_{x \rightarrow \infty} f(x) = -\infty$.