

## Lesson 13 – 4 Vectors

A vector is any quantity with both

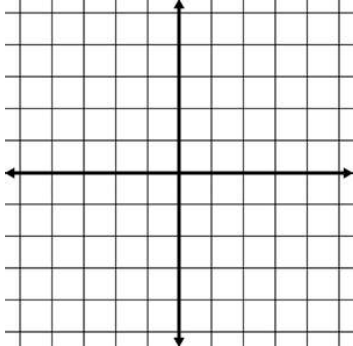
Vectors are often used to describe

If a vector is drawn on a coordinate plane, it looks very much like a

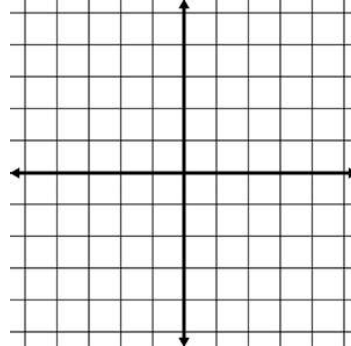
A vector can be represented by

Sketch  $\vec{AB}$ , then name  $\vec{AB}$  as an ordered pair

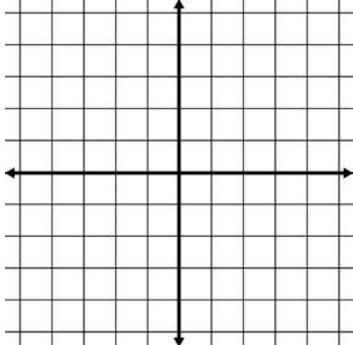
A (2, 3); B(4, 5)



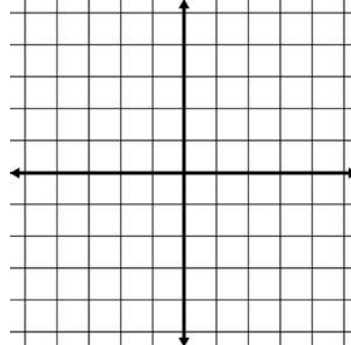
A(-4, 3); B(-1, -1)



A(0, 5); B(-1, -2)



A(4, 2); B(-1, 2)



The magnitude  $|\vec{PQ}|$  of a vector is

Use the distance formula or the Pythagorean Theorem to find the magnitude.

A(2, 3); B(3, 6)

$\vec{AB} = (3, -4)$

A(0, 5); B(-1, 2)

$\vec{AB} = (5, 0)$

Vectors are parallel when

Vectors are perpendicular when

Are the given vectors parallel, perpendicular, or neither?

(10, 2), (1, 5)

(3, 7); (21, -9)

(3, 0), (0, -1)

(-2, -4); (3, 6)

Two vectors are equal if they have

Vectors can be added by following the rule:

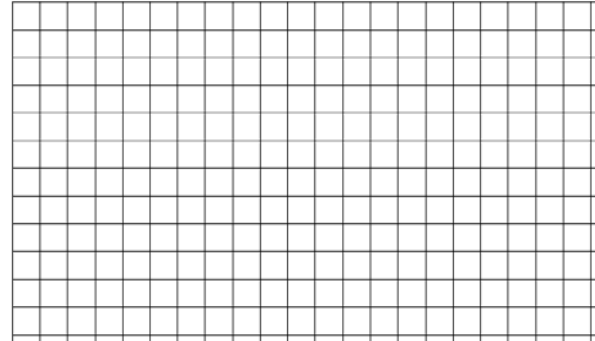
The product of a vector and a real number  $k$  is called

A scalar multiple is

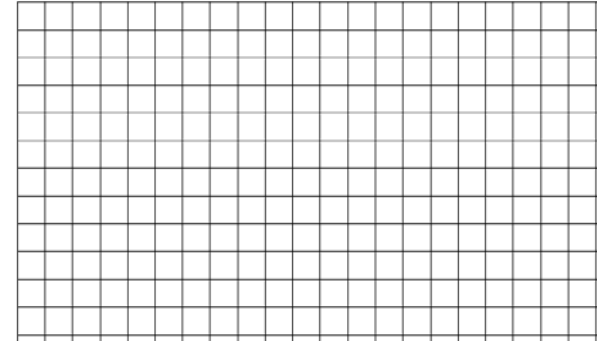
If  $k < 0$ , the direction of  $k \vec{AB}$

Find each vector sum. Then illustrate each sum with a diagram.

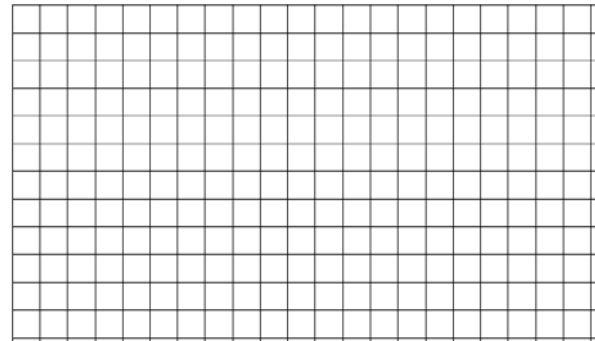
$(4, -2) + (3, 2)$



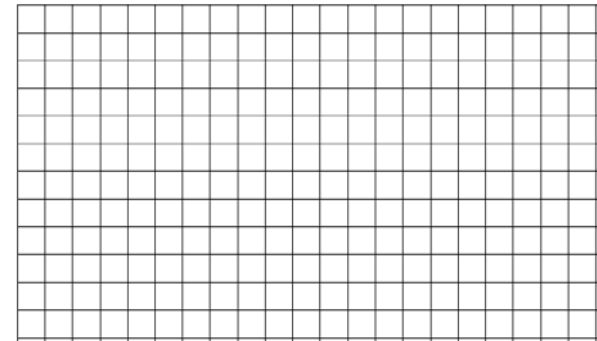
$(-5, 3) + (2, 2)$



$(3, 1) + 2(3, 6)$



$(-6, 3) + 5(0, -1)$



Name two vectors parallel to  $(4, -3)$

Name 2 vectors perpendicular to  $(-14, 16)$

The vectors  $(3, 5)$  and  $(7, k)$  are parallel. Find  $k$

The vectors  $(5, 8)$  and  $(k, 2)$  are perpendicular. Find  $k$