Algebraic Vectors
Section 8.2
Lesson 15
2.25.16
Warm-up

1) Find the distance between the two points: (1,-2) (-3,5).

2) Find the distance between the two points: (0,1) (-2,3).

3) Simplify $\sqrt{52}$

4) $Simplify\ \sqrt{72}$

Friday is the last day to make up missing assignments, tests, and quizzes.

$$Given: P_1 = (x_1, y_1), P_2 = (x_2, y_2)$$

$The\ vector\ \overrightarrow{P_1, P_2}$ can be written as an **ordered pair**, $\langle, x_2 - x_1, y_2 - y_1 \rangle$

A vector can be represented as an ordered pair.
Its **magnitude**, $\left|\overrightarrow{P_1, P_2}\right|$, can be found using the distance formula.
$\left|\overrightarrow{P_1, P_2}\right| = \sqrt{(x_2 - x_1) + (y_2 - y_2)}$

I do:
Write the ordered pair that represents the vector X(-3,5) to Y(4,-2).
Then find the magnitude.

Find ordered pair using formula $\langle, x_2 - x_1, y_2 - y_1 \rangle$	
Find magnitude using distance formula $\sqrt{(x_2 - x_1) + (y_2 - y_2)}$	

We do:
Write the ordered pair that represents the vector X(4,2) to Y(2,8).
Then find the magnitude.

Find ordered pair using formula	
Find magnitude using distance formula	

You do with your partner:
Write the ordered pair that represents the vector X(5,0) to Y(7,6).
Then find the magnitude.

Find ordered pair using formula	
Find magnitude using distance formula	

Work on Pg 496 # 14-20 evens

Vector Operations	The following operations are defined for $\vec{\mathbf{a}}\ \langle a_1, a_2\rangle$, $\vec{\mathbf{b}}\ \langle b_1, b_2\rangle$, and any real number k. Addition: $\vec{\mathbf{a}} + \vec{\mathbf{b}} = \langle a_1, a_2\rangle + \langle b_1, b_2\rangle = \langle a_1 + b_1, a_2 + b_2\rangle$ Subtraction: $\vec{\mathbf{a}} - \vec{\mathbf{b}} = \langle a_1, a_2\rangle - \langle b_1, b_2\rangle = \langle a_1 - b_1, a_2 - b_2\rangle$ Scalar multiplication: $k\vec{\mathbf{a}} = k\langle a_1, a_2\rangle = \langle ka_1, ka_2\rangle$

I do:
$\vec{m}=\langle 5,-7\rangle$
$\vec{n}=\langle 0,4\ \rangle$
$\vec{p}=\langle -1,3\ \rangle$

Solve for $\vec{p}-3\vec{n}$

Do Scalar multiplication first	$3\vec{n}= 3\langle 0,4\ \rangle = \langle 0,12\rangle$
Simplify	$\langle -1,3\ \rangle - \langle 0,12\rangle$ $\langle -1-0,3-12\rangle$ $\langle -1,-9\rangle$

We do:

$\vec{m}=\langle 5,-7\rangle$
$\vec{n}=\langle 0,4\ \rangle$
$\vec{p}=\langle -1,3\ \rangle$

Solve for $-2\vec{m}-\vec{p}+3\vec{n}$

Do Scalar multiplication first	
Simplify	

You do with your partner:

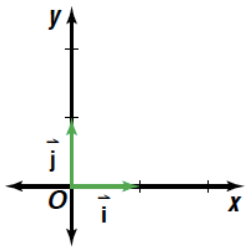
$\vec{m}=\langle 5,-7\rangle$
$\vec{n}=\langle 0,4\rangle$
$\vec{p}=\langle -1,3\rangle$

1) Solve for $-2\vec{m}-\vec{p}+3\vec{n}$

2) Solve for $2\vec{p}+\vec{n}$

Work on Pg 496 # 24-34 evens

A vector that has a magnitude of one unit is called a **unit vector.** A unit vector in the direction of the positive x-axis is represented by $\vec{\mathbf{i}}$, and a unit vector in the direction of the positive y-axis is represented by $\vec{\mathbf{j}}$. So, $\vec{\mathbf{i}} = \langle 1, 0 \rangle$ and $\vec{\mathbf{j}} = \langle 0, 1 \rangle$.



I do

Find the magnitude of each vector. Then write the vector as the sum of unit vectors.

1) $\langle -1,3 \rangle$

Break up the vector	$\langle -1,3 \rangle = \langle -1,0 \rangle + \langle 0,3 \rangle$
Separate into unit vectors	$-1\langle 1,0 \rangle + 3\langle 0,1 \rangle$
Replace with $\vec{\imath}$ *and* $\vec{\jmath}$ vectors	$-1\vec{\imath} + 3\vec{\jmath}$
Find the magnitude using the distance formula	$\langle -1,0 \rangle + \langle 0,3 \rangle$ $\sqrt{(3-0)^2 + \big(0-(-1)\big)^2}$ $\sqrt{(3)^2 + (1)^2}$ $\sqrt{9+1} = \sqrt{10}$

We Try

Find the magnitude of each vector. Then write the vector as the sum of unit vectors.

$\langle 2,1 \rangle$

Break up the vector	
Separate into unit vectors	
Replace with $\vec{\imath}\ and\ \vec{\jmath}$ vectors	
Find the magnitude using the distance formula	

You Try:

Find the magnitude of each vector. Then write the vector as the sum of unit vectors.

1) $\langle -2,0 \rangle$

2) $\langle 3,-2 \rangle$

Work on Pg 496 # 36-40 evens

Exit Ticket:

Given,

$\vec{m}=\langle 5,-7\rangle$

$\vec{n}=\langle 0,4\rangle$

$\vec{p}=\langle -1,3\rangle$

1) Solve for $-2\vec{m}+\vec{n}$

2) Write the ordered pair that represents the vector X(3,2) to Y(-1,6). Find the magnitude too.

3) Find the magnitude of each vector. Then write the vector as the sum of unit vectors. $\langle -1,3\rangle$