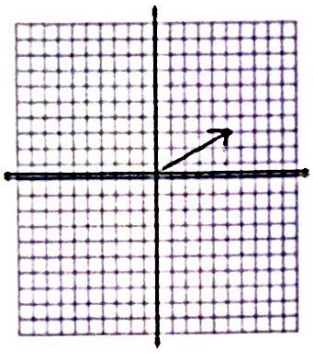
Name: Key

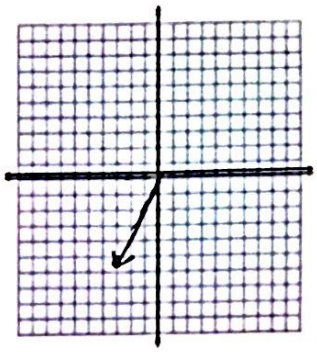
Vectors

Draw each vector:

1) <5, 3>



2.) <-3, -5>

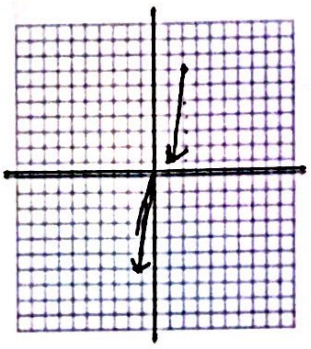


Draw the vector between the two points. Find the component form, then sketch it.

3.) (2, 7) and (1, 1)

$\langle 1-2, 1-7 \rangle$

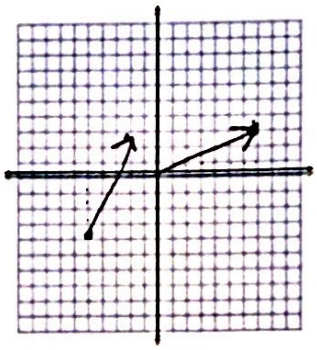
$\boxed{\langle -1, -6 \rangle}$



4.) (-5,-4) and (-2, 3)

$\langle 3--4, -2--5 \rangle$

$\langle 7, 3 \rangle$



Determine if the following vectors or equivalent.

5.) $\overrightarrow{RS} = \overrightarrow{XY}$, given R = (-3,7) , S = (0, 4) and X = (-2, 11) , Y = (1, 14)

$\overrightarrow{RS} = \langle 0--3, 4-7 \rangle$

$= \langle 3, -3 \rangle$

$\overrightarrow{XY} = \langle 1--2, 14-11 \rangle$

$= \langle 3, 3 \rangle$

No not same direction

$||\overrightarrow{RS}|| = ||\overrightarrow{XY}||$

$= \sqrt{18}$

not Equivalent

6.) $\overrightarrow{RS} = \overrightarrow{XY}$, given R = (9. -5) , S = (-1, -1) and X = (10, 0)) , Y = (0, 4)

$\overrightarrow{RS} = \langle -10, 4 \rangle$ Same direction

$\overrightarrow{XY} = \langle -10, 4 \rangle$ $||RS|| = \sqrt{116}$ $||XY|| = \sqrt{116}$ Same magnitude

yes equivalent

Find the direction (component form) and magnitude.

7.) E = (10, -3) , F = (5, 2)

$\overrightarrow{EF} = \langle 5-10, 2--3 \rangle$

$\langle -5, 5 \rangle$

$||EF|| = \sqrt{50} = 5\sqrt{2}$

8.) G = (2,7) , H = (2, 3)

$\overrightarrow{GH} = \langle 2-2, 3-7 \rangle$

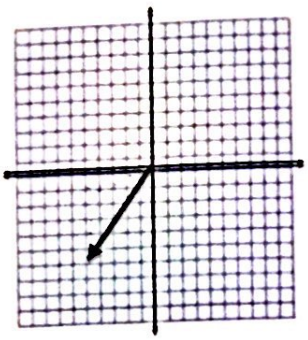
$= \langle 0, -4 \rangle$

$||\overrightarrow{GH}|| = \sqrt{16} = 4$

Find the direction and magnitude for each of the following vectors. Then write in component form and ai + bj form.

(-6,3)(4,-5)

9.)

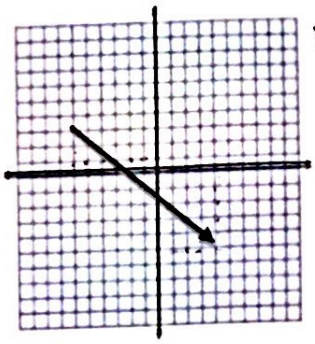


$\langle -4,-5\rangle$

$\|v\| = \sqrt{65}$

$-4i-5j$

10.)



$V = \langle 4--6,-5-3\rangle$

$= \langle 10,-8\rangle$

$\|v\| = \sqrt{164}$

$10i-8j$

Use the given information to find the vector algebraically.

$\vec{V} = \langle 3,2\rangle, \vec{U} = \langle -6,2\rangle, R = (-2,11), S = (4,-5)$

$\vec{RS} = \langle 6,-16\rangle$

$3\vec{SR}$

11.) $\vec{U} - \vec{V}$

$\langle -9,0\rangle$

12.) $\vec{U} + \overrightarrow{RS}$

$\langle 0,-14\rangle$

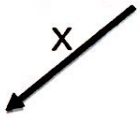
13.) $2\vec{U} - 3\vec{SR}$

$\vec{SR} = \langle 6,-16\rangle$

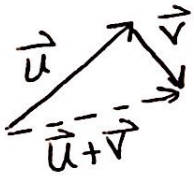
$\langle -12,4\rangle - \langle 18,-48\rangle$

$\langle -30,-44\rangle$

Find the resultant vector geometrically:

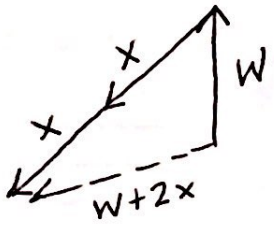


14.) U + V



15.) 2U − V

16.) W + 2X



For each of the following find
a) the dot product v·w
b) the angles between v and w,
c) the unit vector of v

17) $v = i - j$ and $w = i + j$

a) $V \cdot W = 0$

b) $\theta = 90°$

c) $V = \langle \frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\rangle$

18.) $v = \sqrt{3}i - j$ and $w = i + j$

a) $V \cdot W = \sqrt{3} - 1$

b) $\theta = 75°$

c) $V = \langle \frac{\sqrt{3}}{2}, -\frac{1}{2}\rangle$