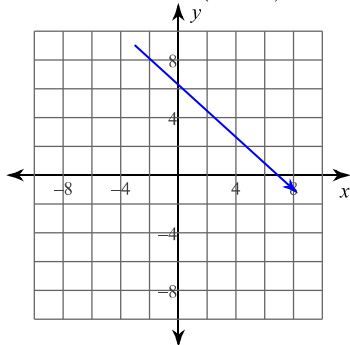


## Two-Dimensional Vector Basics

Write each vector in component form.

1)  $\overrightarrow{RS}$  where  $R = (-3, 9)$   $S = (8, -1)$

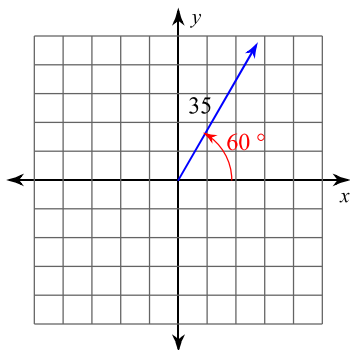


$$\langle 11, -10 \rangle$$

2)  $\overrightarrow{PQ}$  where  $P = (-10, 5)$   $Q = (-9, -10)$

$$\langle 1, -15 \rangle$$

3)



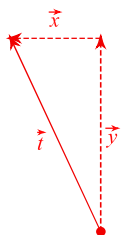
$$\left\langle \frac{35}{2}, \frac{35\sqrt{3}}{2} \right\rangle$$

4)  $|\vec{k}| = 52, 174^\circ$

$$\langle -51.72, 5.44 \rangle$$

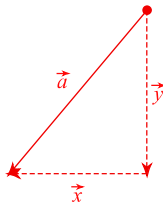
Draw a diagram to illustrate the horizontal and vertical components of the vector. Then find the magnitude of each component.

5)  $|\vec{t}| = 26, 115^\circ$



Horizontal:  $-10.99$   
Vertical:  $23.56$

6)  $|\vec{a}| = 15, 230^\circ$



Horizontal:  $-9.64$   
Vertical:  $-11.49$

Find the magnitude and direction angle for each vector.

7)  $8\vec{i} + 15\vec{j}$

$17$   
 $61.93^\circ$

8)  $\vec{r} = \langle -8, -41 \rangle$

$\sqrt{1745} \approx 41.773$   
 $258.96^\circ$

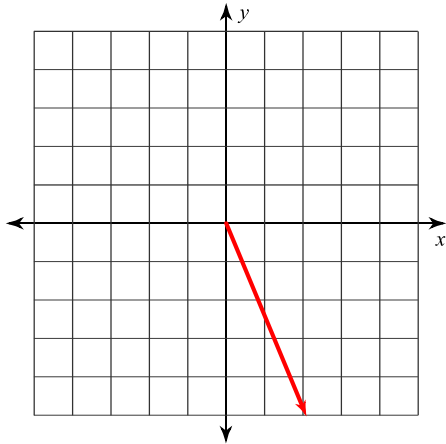
Find the component form, magnitude, and direction angle for the given vector

9)  $\overrightarrow{CD}$  where  $C = (6, -3)$   $D = (-6, -9)$

$\langle -12, -6 \rangle$   
 $6\sqrt{5} \approx 13.416$   
 $206.57^\circ$

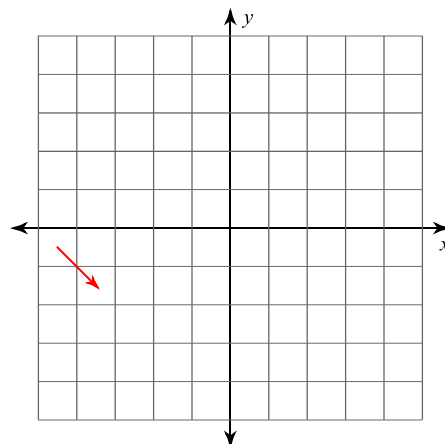
Sketch a graph of each vector then find the magnitude and direction angle.

10)  $5\vec{i} - 12\vec{j}$



$13$   
 $292.62^\circ$

11)  $\overrightarrow{RS}$  where  $R = (-9, -1)$   $S = (-7, -3)$



$2\sqrt{2} \approx 2.828$   
 $315^\circ$

**Critical thinking question:**

12) Find the component form of  $\vec{v}$  with a magnitude of 50 in the opposite direction of  $\vec{u} = \left\langle 2, -\frac{3}{2} \right\rangle$

$$\vec{v} = \langle -40, 30 \rangle$$