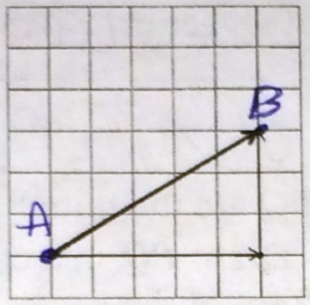
Vector: ↗ Direction Magnitude

Initial point: Starts

Terminal Point: END

Component Form: $\overrightarrow{AB} = \langle 5, 3 \rangle$

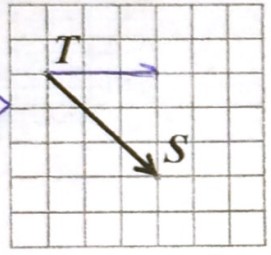


$\overrightarrow{AB}$

In the diagram, name each vector and write its component form.

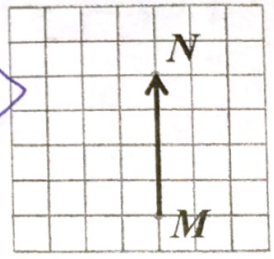
Ex. 1:

$\overrightarrow{TS} = \langle 3, -3 \rangle$



Ex. 2:

$\overrightarrow{MN} = \langle 0, 4 \rangle$



Ex. 3: Determine if each is a vector or scalar quantity.

a. A ball is rolling 10 miles per hour. scalar

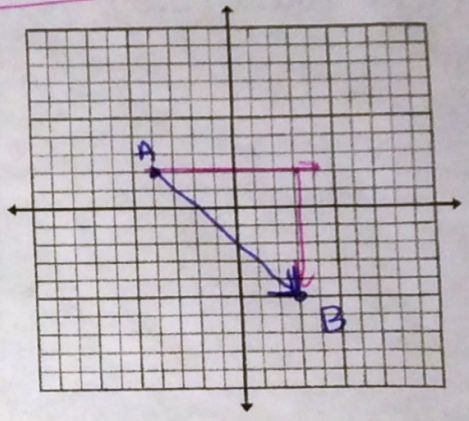
b. A ball is rolling north east 10 miles per hour

Direction Magnitude

vector

Ex. 4: Find the component form of $\overrightarrow{AB}$ with initial point $A(-4, 2)$ and terminal point $B(3, -5)$.

$\overrightarrow{AB} = \langle 7, -7 \rangle$

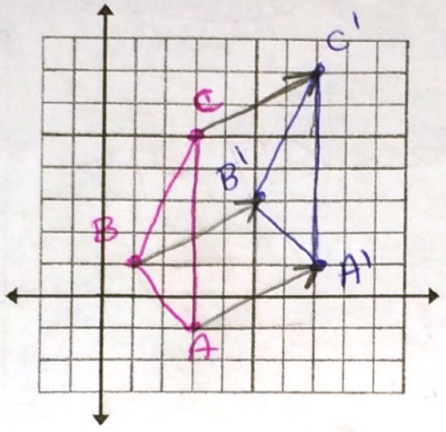


Ex. 5: Find the component form of $\overline{AB}$ with initial point $A(-2, -7)$ and terminal point $B(6, 1)$.

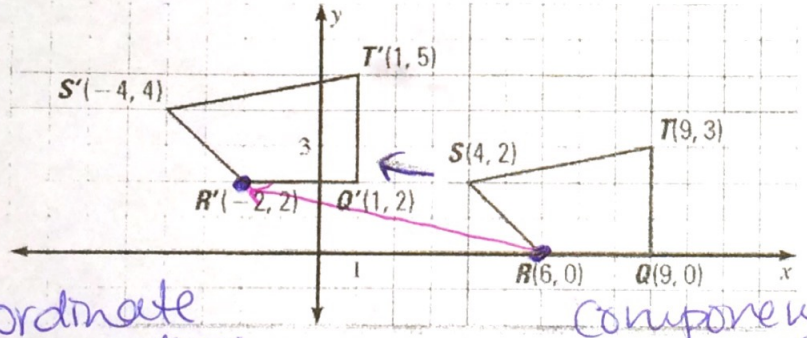
$\overrightarrow{AB} = \langle 8, 8 \rangle$

$\langle x_2 - x_1, y_2 - y_1 \rangle$

Ex. 6: The component form of $\overrightarrow{GH}$ is $\langle 4,2 \rangle$. Use $\overrightarrow{GH}$ to translate the triangle whose vertices are $A(3,-1)$, $B(1,1)$, and $C(3,5)$.



Ex. 7: In the diagram, *QRST* maps onto *Q'R'S'T'* by a translation. Write the component form of the vector that can be used to describe the translation.



Coordinate Notation: $(x,y) \rightarrow (x-8, y+2)$

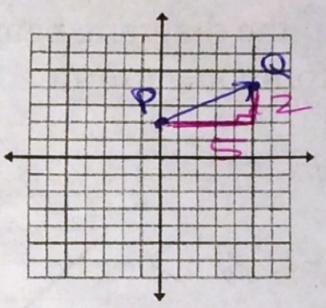
Component form: $\langle -8, 2 \rangle$

Magnitude of a vector: length of the vector

$$\|\vec{v}\| = \sqrt{(x)^2 + (y)^2}$$

Points *P* and *Q* are the initial and terminal points of the vector $\overrightarrow{PQ}$. Draw $\overrightarrow{PQ}$ in a coordinate plane. Write the component form of the vector and find its magnitude.

Ex. 8: $P(0,2)$, $Q(5,4)$



$\overrightarrow{PQ} = \langle 5, 2 \rangle$

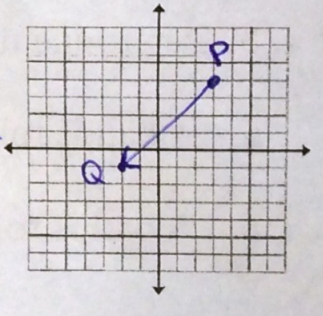
$\|\overrightarrow{PQ}\| = \sqrt{29} \approx 5.39$ units

$5^2 + 2^2 = c^2$

$25 + 4 = c^2$

$\sqrt{29} = \sqrt{c^2}$

Ex. 9: $P(3,4)$, $Q(-2,-1)$



$\overrightarrow{PQ} = \langle -5, -5 \rangle$

$\|\overrightarrow{PQ}\| = \sqrt{(-5)^2 + (-5)^2}$

$\sqrt{25 + 25}$

$\sqrt{50} < 25$ (5 · 5)

$\|\overrightarrow{PQ}\| = \sqrt{50} = 5\sqrt{2} \approx 7.07$ units