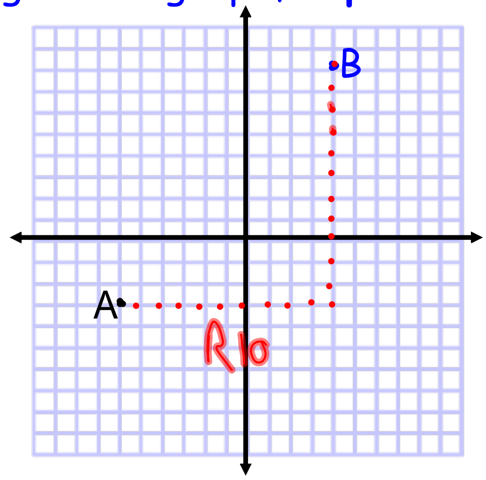
Bell Work

Looking at the graph, **explain** how point *A* moves to point B



Right 10
Up 11

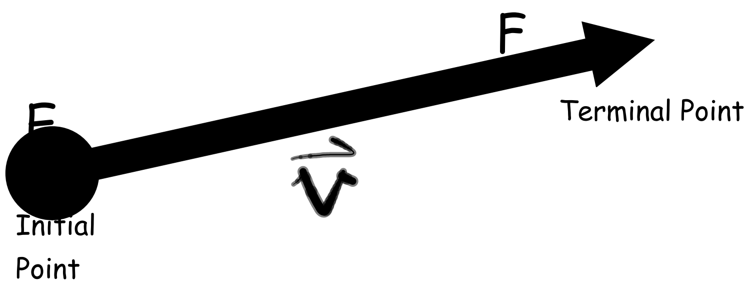
(x + 10, y + 11)

2.1 Translations/11.1 Dilations

Vector- a quantity that has both direction and magnitude

Initial point- the starting point

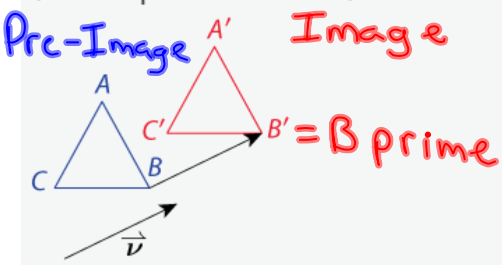
Terminal point- the ending point



To name this vector: $\overrightarrow{EF}$ or $\vec{v}$

It is convenient to describe translations using vectors. A translation is a transformation along a vector such that the segment joining a point and its image has the same length as the vector and is parallel to the vector.

For example, $\overline{BB'}$ is a line segment that is the same length as vector $\vec{v}$ and is parallel to vector $\vec{v}$.



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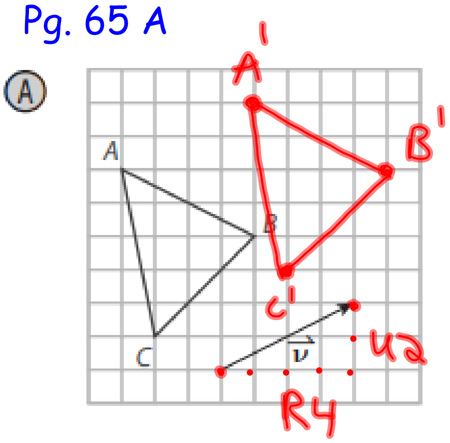

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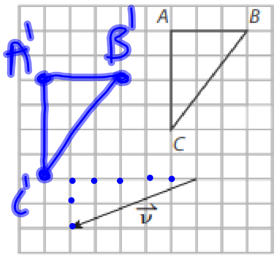
Your Turn

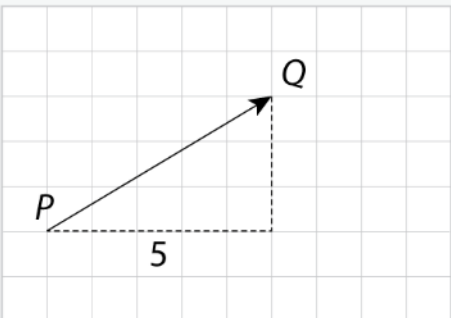
4. Draw the image of $\triangle ABC$ after a translation along $\vec{v}$.

L5

D2



A vector can also be named using component form, $\langle a, b \rangle$, which specifies the horizontal change *a* and the vertical change *b* from the initial point to the terminal point.



x, y

$\langle a, b \rangle$

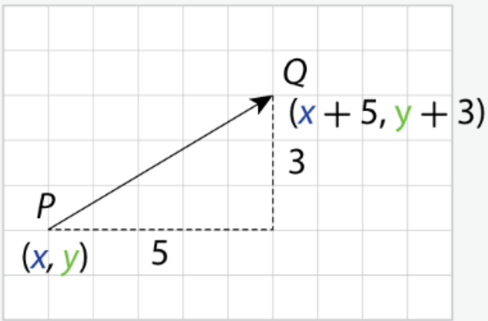
+a - Right

-a - Left

+b - Up

-b - down

The component form for $\overline{PQ}$ is $<5, 3>$. You can use the component form of the vector to draw coordinates for a new image on a coordinate plane. When you move an image to the right *a* units and up *b* units, you use the rule $(x, y) \to (x + a, y + b)$, which is the same as moving the image along vector $<a, b>$.



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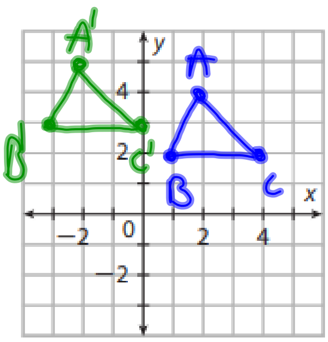
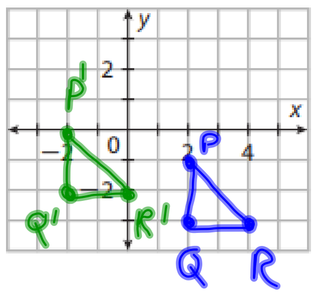
Your Turn

Draw the preimage and image of each triangle under a translation along $\langle -4, 1\rangle$.

5. Triangle with coordinates: $A(2, 4)$, $B(1, 2)$, $C(4, 2)$.

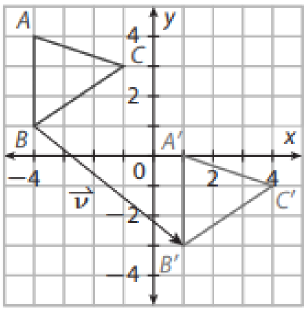


6. Triangle with coordinates: $P(2, -1)$, $Q(2, -3)$, $R(4, -3)$.



Find the vector in component form pg 67

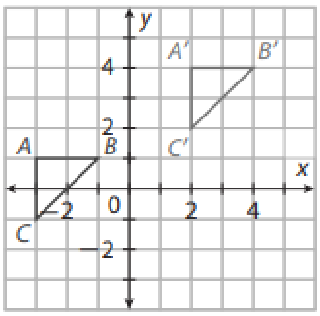
A



$\langle 5, -4 \rangle$

D4 R5

B



R5 U3

$\langle 5, 3 \rangle$

Rules for Translations on a Coordinate Plane

Translation *a* units to the right

$(x, y) \rightarrow (x + a, y)$

Translation *a* units to the left

$(x, y) \rightarrow (x - a, y)$

Translation *b* units up

$(x, y) \rightarrow (x, y + b)$

Translation *b* units down

$(x, y) \rightarrow (x, y - b)$

Now use the rule to calculate the missing coordinates. Drag the coordinates to the proper locations to complete the table below.

Preimage coordinates (x, y)	Image Coordinates $(x - 4, y - 3)$
(1, 3)	(-3, 0)
(0, 1)	(-4, -2)

(-4, -2) (-3, 0) (2, 1) (-2, -2)

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