A **transformation** is a change in the Place, position, or size of a figure.

A **translation** is a transformation which slides each point of a figure the same distance and in the same direction.

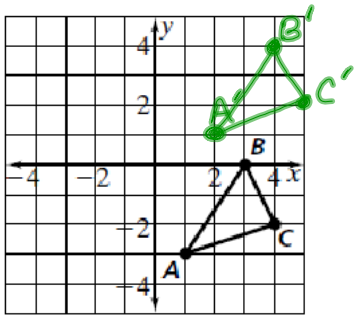
The resulting figure after a transformation is called the IMAGE of the original figure.

$\triangle ABC \rightarrow \triangle A'B'C'$

original image — new image

Oct 23-9:43 AM

EXAMPLE 1:
ΔABC is translated 1 unit right and 4 units up. Draw the image $\Delta A'B'C'$.



What are the coordinates of:

originals

$A(1,-3) \rightarrow A'$ (2, 1)

$B(3,0) \rightarrow B'$ (4, 4)

$C(4,-2) \rightarrow C'$ (5, 2)

From EXAMPLE 1, $\Delta ABC \rightarrow \Delta A'B'C'$

As a general rule this translation could be written as $(x, y) \rightarrow (x + 1, y + 4)$.

What are the coordinates of:

A (1, -3) $\rightarrow A'$ _____

B (3, 0) $\rightarrow B'$ _____

C (4, -2) $\rightarrow C'$ _____

From EXAMPLE 1, $\Delta ABC \rightarrow \Delta A'B'C'$

As a general rule this translation could be written as $(x, y) \rightarrow$ $(x + \_\_, y + \_\_)$.

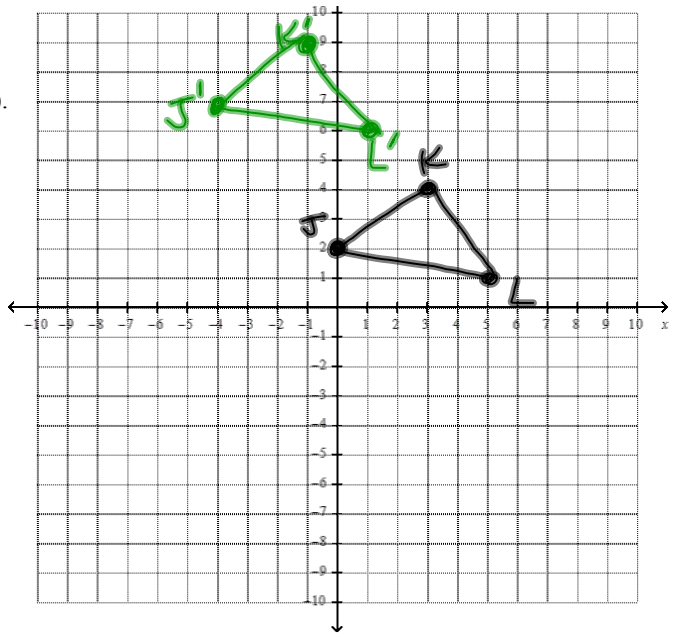
Oct 23-9:45 AM

EXAMPLE 2:

ΔJKL has coordinates J (0,2), K (3,4), and L (5,1).

a) Draw ΔJKL.

b) Draw the image $\Delta J'K'L'$ after a translation of 4 units to the left and 5 units up. Label the triangle.



What are the coordinates of:

J (0,2) → J' (-4,7)

K (3,4) → K' (-1,9)

L (5,1) → L' (1,6)

Rule: $(x, y) \rightarrow$ (x-4 , y+5)

Tell me more about this figure, is it congruent or similar? Explain how you know.

congruent

Oct 23-9:46 AM

Translation Location

	Add	Subtract
x coordinate	shift right x + ___	shift left x − ___
y coordinate	shift up y + ___	shift down y − ___

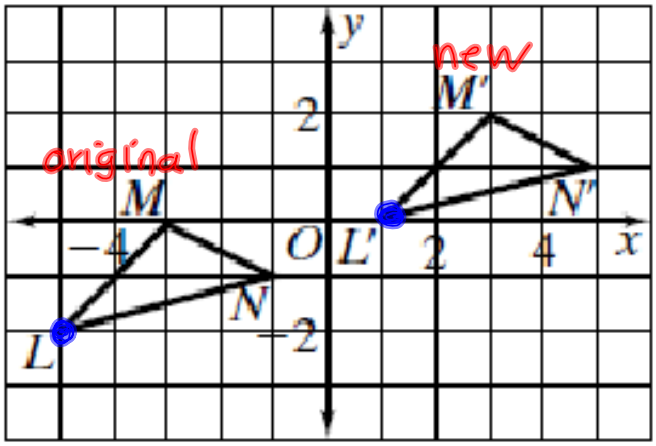
Oct 23-9:48 AM

EXAMPLE 3:

right 6 up 2

Write a general rule which describes the translation shown below. ΔLMN is the original triangle.

$(x, y) \rightarrow$ (x+6 , y+2)



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

Oct 23-9:48 AM

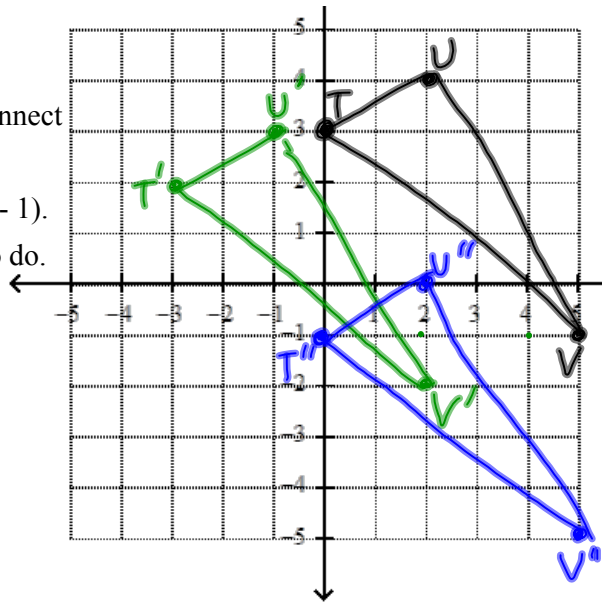
EXAMPLE 4:

a) Graph points $T(0,3)$, $U(2, 4)$ and $V(5, -1)$ and connect the points to make a triangle.

b) Translate ΔTUV using the rule $(x, y) \rightarrow (x - 3, y - 1)$.

c) In words, describe what the rule is asking you to do.

shifts left 3, down 1



d) Draw the image $\Delta T'U'V'$.

e) Identify the coordinates of $\Delta T'U'V'$.

T' (-3, 2)
U' (-1, 3)
V' (2, -2)

f) Using the image of $\Delta T'U'V'$ perform an additional translation using the rule $(x, y) \rightarrow (x + 3, y - 3)$. State the new coordinates of $\Delta T''U''V''$. Is this new image congruent or similar to the original figure?

T" (0, -1)
U" (2, 0)
V" (5, -5)
congruent

Oct 23-9:49 AM

Practice:

1) a) Use arrow notation to write a rule for the given translation.

right 5 units, up 1 unit

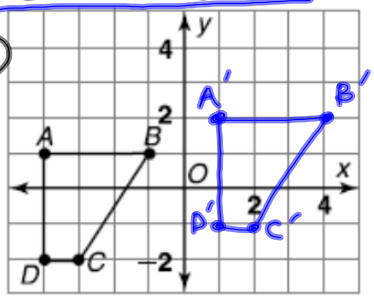
$(x, y) \longrightarrow (x+5, y+1)$

b) Graph and label the image after the translation.

c) Name the coordinates of the image.

A' (1,2) B' (4,2)

C' (2,-1) D' (1,-1)



2) a) Use arrow notation to write a rule for the given translation.

left 3 units, down 2 units

$(x, y) \longrightarrow (x-3, y-2)$

b) Graph and label the image after the translation.

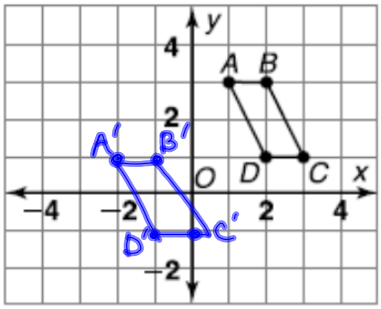
c) Name the coordinates of the image.

A' (-2,1)

B' (-1,1)

C' (0,-1)

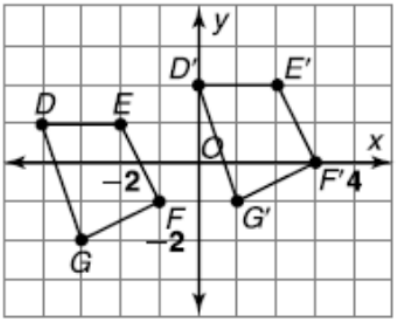
D' (-1,-1)



Oct 23-9:50 AM

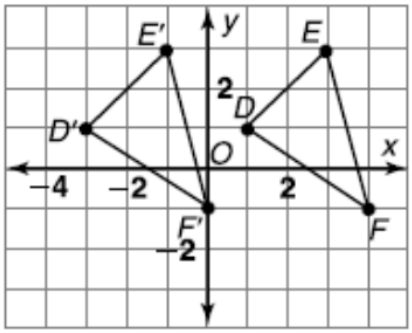
In questions 3 and 4 below, use arrow notation to write a rule that describes the translation shown on the graph.

3)



③ $(x, y) \rightarrow (x+4, y+1)$

4)



④ $(x, y) \rightarrow (x-4, y)$

Oct 23-9:52 AM

5) MULTIPLE CHOICE:

Write a description of the rule $(x, y) \rightarrow (x-7, y+4)$.

(a) translation 7 units to the right and 4 units up
(b) translation 7 units to the left and 4 units down
(c) translation 7 units to the right and 4 units down
(d) translation 7 units to the left and 4 units up

Oct 23-9:56 AM