**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**M8-U3: Notes #1 – Transformational Geometry -Translations Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

A **transformation** is a change in the \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a figure.

A **translation** is a transformation which \_\_\_\_\_\_\_\_\_\_\_\_ each point of a figure the same \_\_\_\_\_\_\_\_\_\_\_\_ and in the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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

**EXAMPLE 1:**

Δ*ABC* is translated 1 unit right and 4 units up. Draw the image Δ*A’B’C’*.

What are the coordinates of:

*A* (1, -3) 🡪 *A’* \_\_\_\_\_\_\_\_\_

*B* (3, 0) 🡪 *B’* \_\_\_\_\_\_\_\_\_

*C*  (4, -2) 🡪 *C’*\_\_\_\_\_\_\_\_\_\_

From EXAMPLE 1, *ΔABC* 🡪 *ΔA’B’C’*

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

**EXAMPLE 2:**

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

a) Draw Δ*JKL*.

b) Draw the image Δ*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’* \_\_\_\_\_\_\_\_\_

*K* (3, 4) 🡪 *K’* \_\_\_\_\_\_\_\_\_

*L* (5, 1) 🡪 *L’*\_\_\_\_\_\_\_\_\_\_

Rule: (*x*, *y*) 🡪 ( , )

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

Translation Location

|  |  |  |
| --- | --- | --- |
|  | Add | Subtract |
| *x* coordinate |  |  |
| *y* coordinate |  |  |

**EXAMPLE 3:**

Write a general rule which describes the translation shown below. Δ*LMN*  is the original triangle.

(*x, y*) 🡪 ( , )

**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 Δ*TUV* using the rule (*x, y*) 🡪 (*x* - 3, *y* - 1).

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

d) Draw the image Δ*T’U’V’*.

e) Identify the coordinates of Δ*T’U’V’*.

*T’*

*U’*

*V’*

f) Using the image of Δ*T’U’V’* perform an additional translation using the rule

 (*x, y*) 🡪 (*x* + 3, *y* - 3). State the new coordinates of Δ*T”U”V”.* Is this new image congruent or similar to the original figure?

**Practice:**

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

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Graph and label the image after the translation.

c) Name the coordinates of the image.

A’ \_\_\_\_\_\_\_\_\_\_\_\_\_ B’ \_\_\_\_\_\_\_\_\_\_\_\_\_

C’ \_\_\_\_\_\_\_\_\_\_\_\_\_ D’ \_\_\_\_\_\_\_\_\_\_\_\_

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

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Graph and label the image after the translation.

c) Name the coordinates of the image.

 A’ \_\_\_\_\_\_\_\_\_\_\_\_\_

 B’ \_\_\_\_\_\_\_\_\_\_\_\_\_

 C’ \_\_\_\_\_\_\_\_\_\_\_\_\_

 D’ \_\_\_\_\_\_\_\_\_\_\_\_\_

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

**3)** **4)**

**5)** MULTIPLE CHOICE:

Write a description of the rule .

**(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