

Concept: Transformations

Name: _____

- You should have completed **Graphing – Section 4 Part A: Transformations** before beginning this handout.

PART B: COMPUTER COMPONENT

Instructions: In  follow the **Content Menu** path:

Graphing > Transformations



Work through all Sub Lessons of the following Lessons **in order**:

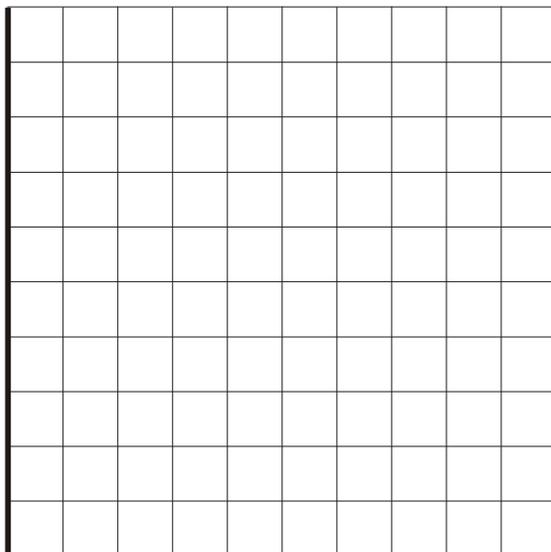
- *Translations*
- *Reflections*
- *Rotations*
- *Dilations*



The remainder of your notes will be taken by filling in the blanks and by making sketches of the exercises while you perform the above lessons on the computer.

Use the grids provided for your sketches.

1. *Translation*



A (,) maps onto A' (,)

B (,) maps onto B' (,)

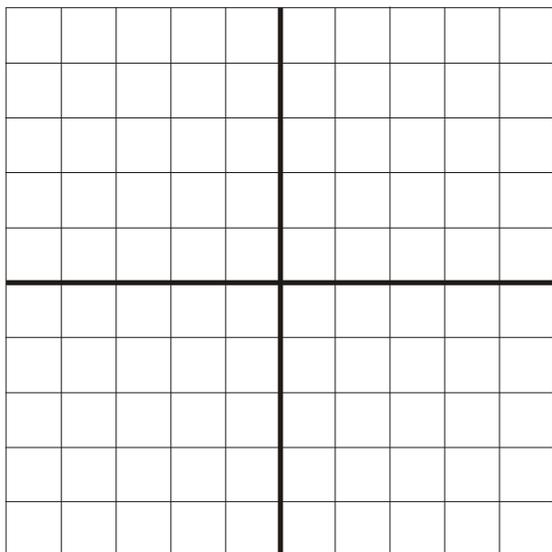
C (,) maps onto C' (,)

This results in the mapping rule (x,y)

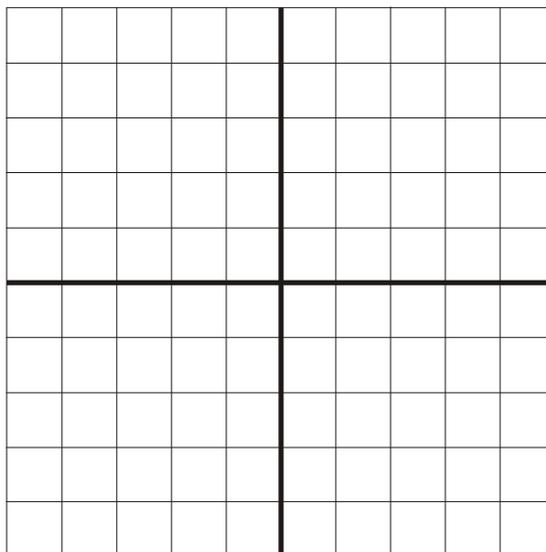
➔ (,)

Therefore _____ is added to the x-coordinate and _____ is added to the y-coordinate.

From example 1:



From example 2:

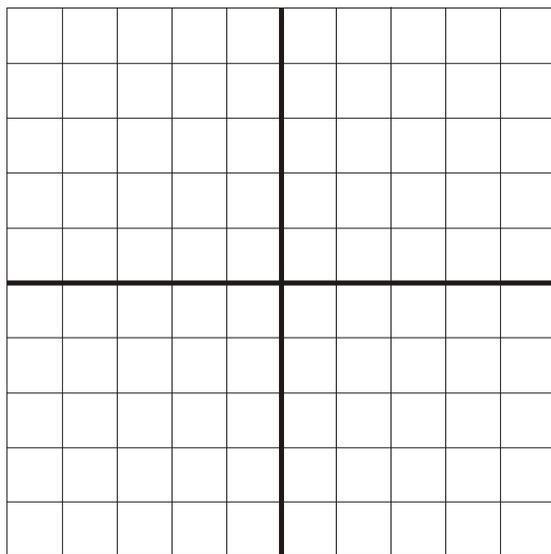


Explain how the order of the translations affects the final image produced.

Explain how two different translations can be combined into one.

2. *Reflection* (can also be called a “Flip”)

Sketches



Reflection Mapping Rules

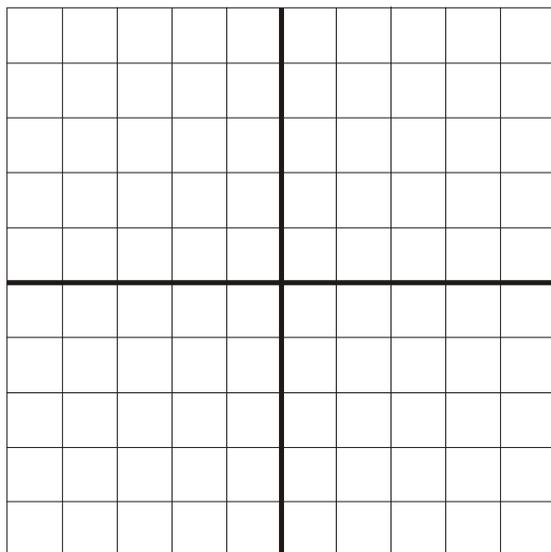
the 1st one we used
 $(x,y) \rightarrow (\quad , \quad)$

from example 1
 $(x,y) \rightarrow (\quad , \quad)$

from example 2
 $(x,y) \rightarrow (\quad , \quad)$

3. Rotation

Sketches



Rotation Mapping Rules

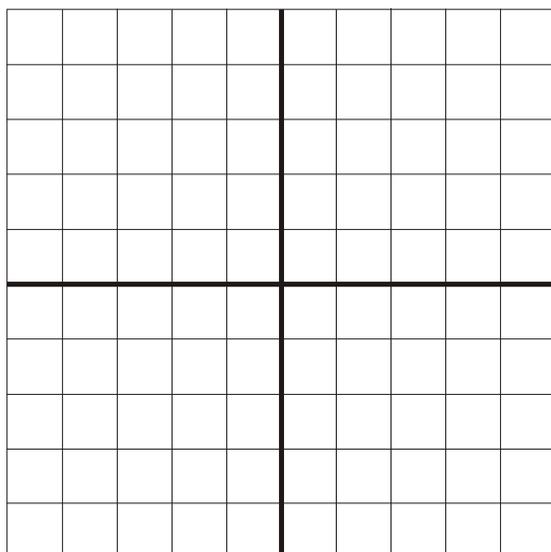
the 1st one we used
 $(x,y) \rightarrow (\quad , \quad)$

from example 1
 $(x,y) \rightarrow (\quad , \quad)$

from example 2
 $(x,y) \rightarrow (\quad , \quad)$

4. Dilatation

Sketches



Dilatation Mapping Rules

the 1st one we used
 $(x,y) \rightarrow (\quad , \quad)$

from example 1
 $(x,y) \rightarrow (\quad , \quad)$

from example 2
 $(x,y) \rightarrow (\quad , \quad)$

In the first Dilatation that took place, the image was a (n) _____ of the object.

Here, we used the mapping $(x,y) \rightarrow (\quad , \quad)$

In the second Dilatation that took place, the image was a (n) _____ of the object.

Here, we used the mapping $(x,y) \rightarrow (\quad , \quad)$

OFF COMPUTER EXERCISES

1. (a) Using a piece of graph paper from your notebook, draw the following grid:

- ➔ the x-values must range from -12 to 12
- ➔ the y-values must range from -10 to 10

(b) Draw the object (the original figure) on the grid created in (a) using the following coordinates:

A $(-4,0)$, B $(2,-2)$, C $(6,4)$

(c) (i) Complete the following transformations using the object in (b).
 (ii) Identify each transformation as a translation, reflection, rotation or dilatation.

Transformation 1: $(x-1, y+2)$ _____

Transformation 2: $(-y, x)$ _____

Transformation 3: $(2x, 2y)$ _____

Transformation 4: $(y, -x)$ _____

Transformation 5: $(x, -y)$ _____

Transformation 6: $(x+5, y-4)$ _____

Transformation 7: $(-x, -y)$ _____

Transformation 8: $(\frac{1}{2}x, \frac{1}{2}y)$ _____

2. Combine transformations 1 and 6 from above. What is the new transformation formed?

3. (a) Using a piece of graph paper from your notebook, draw the following grid:

- ➔ the x-values must range from -9 to 9
- ➔ the y-values must range from -12 to 12

(b) Draw the object (the original figure) on the grid created in (a) using the following coordinates:

D $(-6,3)$, E $(0,3)$, F $(6,-3)$, G $(-3,-9)$

(c) (i) Complete the following transformations using the object in (b).
 (ii) Identify each transformation as a translation, reflection, rotation or dilatation.

Transformation 1: $(x, -y)$ _____

Transformation 2: $(-y, x)$ _____

Transformation 3: $(x-2, y-3)$ _____

Transformation 4: $(\frac{1}{3}x, \frac{1}{3}y)$ _____

Transformation 5: $(y, -x)$ _____

Transformation 6: $(-x, -y)$ _____