**ML #1 - Dilations (Transformations Unit - Math 7+)**

Part I - Vocabulary: Dilate Image Pre-image

Part II - Review:

|  |  |
| --- | --- |
| A scale factor less than \_\_\_\_ will | A scale factor greater than \_\_\_\_\_\_\_ will |
| A dilated image will always be \_\_\_\_\_\_\_\_\_\_\_ to its original. |

Part III: Dilations

Looking at the coordinates below, identify the scale factor used.

**EXAMPLE 1: EXAMPLE 2:**

A (5, 3), B(2, 5) X(-2, 4), Y(2, 8)

A’(10, 6), B’(4, 10) X’(-1, 2), Y’(1, 4)

SCALE FACTOR:\_\_\_\_\_\_\_\_ SCALE FACTOR:\_\_\_\_\_\_\_

Which example above will make a larger line? Smaller line?

* Graph the original points from Example 1 and 2 on the Graph Page.
* Graph the prime points on the same grids.
* Now use a straight edge to create a line that goes through A and A’ and another line that goes through B and B’ in your graph for example 1. Extend your line through the whole graph shown. Do the lines go through the origin?\_\_\_\_\_\_ Repeat the process for example 2.
* Now try the ones listed below and watch what happens.

**EXAMPLE 3:**

Plot the following points for a triangle and then draw the triangle. Next apply a scale factor of 3. Write the new prime points below and then plot them on the provided graph.

What happens if you go to the graphed figures and draw lines extended from each given point and its prime?

How could you tell that the graphed triangle would get larger or smaller?

R(1, 1) R’(\_\_\_\_, \_\_\_\_\_)

S(1, 4) S’(\_\_\_\_, \_\_\_\_\_)

T(4, 1) T’(\_\_\_\_, \_\_\_\_\_)

**EXAMPLE 4:**

Plot the following points and draw the figure. Next apply a scale factor of 1/3. Write the new prime points below and then plot and draw them on the provided graph.

What happens if you go to the graphed figures and draw lines extended from each given point and its prime?

How could you tell that the graphed triangle would get larger or smaller?

M(-3, -3) M’(\_\_\_\_,\_\_\_\_)

N(0, -9) N’(\_\_\_\_,\_\_\_\_)

Q(-9, -3) Q’(\_\_\_\_,\_\_\_\_)

D(-12, -9) D’(\_\_\_\_,\_\_\_\_)

**EXAMPLE 5:**

What do you think may happen if the scale factor is negative?

Try it with this figure using a scale factor of -2:

What happens with this figure if you go to the graphed figures and draw lines extended from each given point and its prime? Does it still go through the origin?

Describe what happened to the figure:

D(-2, 1) D’(\_\_\_\_,\_\_\_\_)

A(-5, 1) A’(\_\_\_\_,\_\_\_\_)

B(-2, 6) B’(\_\_\_\_,\_\_\_\_)

**EXAMPLE 6:** You create your own figure, apply a scale factor of your choice, and draw the prime figure. You will trade with another student to see if they can determine your scale factor. Mark blanks on your sheet for them to fill out points, prime points, and scale factor.

Example 1: Example 2:

Example 3: Example 4:

Example 5: Example 6:

**D98 NOTES ANSWER KEY**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period:\_\_\_

Dilate: Means to enlarge or reduce the size of an object

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

Scale Factor will determine how much larger or smaller an object will become\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A scale factor greater than one means an object will increase in size

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

A scale factor less than one means an object will decrease in size

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

A dilated image will always be \_similar\_\_to its original image.

TRY THIS:

Looking at the coordinates below, can you identify what scale factor was used?

EXAMPLE 1: EXAMPLE 2:

A (5, 3), B(2, 5) X(-2, 4), Y(2, 8)

A’(10, 6), B’(4, 10) X’(-1, 2), Y’(1, 4)

SCALE FACTOR:times 2\_\_ SCALE FACTOR:\_times ½ \_

Now use the attached graph page to graph the lines formed by both the original points and the prime points in examples 1 and 2 to see what happens. Can you guess which would be larger? Which will be smaller?

Now use a straight edge to create a line that goes through A and A’ and another line that goes through B and B’ in your graph for example 1. Extend your line through the whole graph shown. Do the lines go through the origin?\_YES\_ Repeat the process for example 2.

You have just dilated your first figures in a coordinate plane. Now try the ones listed below and watch what happens.

**EXAMPLE 3:**

Plot the following points for a triangle and then draw the triangle. Next apply a scale factor of 3. Write the new prime points below and then plot them on the provided graph.

What happens if you go to the graphed figures and draw lines extended from each given point and its prime?

How could you tell that the graphed triangle would get larger or smaller?

R(1, 1) R’(\_3\_\_\_, \_\_3\_\_\_)

S(1, 4) S’(\_\_3\_\_, \_\_12\_\_\_)

T(4, 1) T’(\_\_12\_\_, \_\_3\_\_\_)

**EXAMPLE 4:**

Plot the following points and draw the figure. Next apply a scale factor of 1/3. Write the new prime points below and then plot and draw them on the provided graph.

What happens if you go to the graphed figures and draw lines extended from each given point and its prime?

How could you tell that the graphed triangle would get larger or smaller?

M(-3, -3) M’(\_\_-1\_\_,\_\_-1\_\_)

N(0, -9) N’(\_\_0\_\_,\_\_-3\_\_)

Q(-9, -3) Q’(\_\_-3\_\_,\_\_-1\_\_)

D(-12, -9) D’(\_\_-4\_\_,\_\_-3\_\_)

**EXAMPLE 5:**

What do you think may happen if the scale factor is negative? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Try it with this figure using a scale factor of -2:

What happens with this figure if you go to the graphed figures and draw lines extended from each given point and its prime? Does it still go through the origin?

Describe what happened to the figure:

D(-2, 1) D’(\_\_4\_\_,\_\_-2\_\_)

A(-5, 1) A’(\_\_10\_\_,\_\_-2\_\_)

B(-2, 6) B’(\_\_4\_\_,\_\_-12\_\_)

**EXAMPLE 6:** You create your own figure, apply a scale factor, and draw the prime figure. You will trade with another student to see if they can determine your scale factor.