

Dilations Classwork Thurs/Fri 1/9 or 1/10

Divide your graph paper into 4 sections. Complete each dilation in one section of your graph paper. For each problem #1-5 state the scale factor ($k =$) and write a similarity statement. Draw in the dilations lines and determine the center of dilation.

1. $(x, y) \rightarrow (2x, 2y)$

A(1, 1)

B(1, 5)

C(3, 1)

D(3, 5)

2. $(x, y) \rightarrow (3x, 3y)$

D(-1, 3)

E(1, 3)

F(-1, -2)

G(1, -2)

In the 3rd and 4th sections of your graph paper apply the dilations for #3 and #4.

3. $(x, y) \rightarrow (2/3x, 2/3y)$

P(-6, 3)

Q(-3, 9)

R(3, 6)

4. $(x, y) \rightarrow (-2x, -2y)$

S(1, 1)

T(3, 6)

V(3, 1)

On the back of your graph paper apply the dilations for #5 and #6.

5. $(x, y) \rightarrow (2x, 2y)$

Line $y = 1/2x + 3$

(Hint: pick a few points on the line to dilate)

6. Plot a line segment with endpoints at A(-7, 4)

and B(7, -3). Find the coordinates that split the directed line segment AB into a ratio of 2:5.

Questions should be answered on the back of your graph paper under #5 and #6, **OR** on a separate paper and stapled to the back of your graph paper.

- Find the perimeter of each rectangle you graphed in #1 and #2. By what factor does the perimeter increase from the small to large rectangle:
A. in graph #1? B. in graph #2? C. Does this match the original scale factor? If no, explain.
- Find the area of each rectangle you graphed in #1 and #2. By what factor does the area increase from the small to large rectangle:
A. in graph #1? B. in graph #2? C. Does this match the original scale factor? If no, explain.
- If you were given a figure and asked to dilate it with a scale factor of 5:
A. How many times larger would the new figure's perimeter be?
B. How many times larger would the new figure's area be?
- A figure has a perimeter of 12.5 cm and an area of 8cm^2 . A dilation of $(x, y) \rightarrow (4x, 4y)$ is applied.
A. What is the new area? B. What is the new perimeter?
- What is the general relationship between the scale factor and how the perimeter scales?
- What is the general relationship between the scale factor and how the area scales?
- Where is the center of dilation when using coordinate dilations $(x, y) \rightarrow (kx, ky)$?

Describe what happens to the final figure if a dilation is applied with the given scale factor (Use #1-4 to help you)

- The scale factor is more than one ($k > 1$)
- The scale factor is between zero and one ($0 < k < 1$)
- The scale factor is negative ($k < 0$). Be as specific as possible.
- What does the dilated line have in common with the original line?
- Look back at line segment AB on graph #6. How do you know if you have divided your line segment in a ratio of 2:5 or 5:2?