

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

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

**UNIT 5**

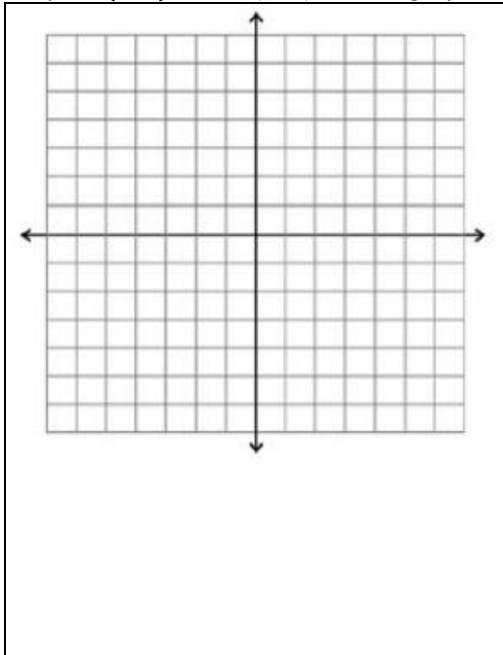
**LESSON 7**

**AIM: HOW DO WE DILATE A LINE?**

*Do Now:* Find the slope of the following points-  $(0, -2)$  and  $(3, 4)$ .

**SCENARIO #1: CENTER OF DILATION OFF THE LINE**

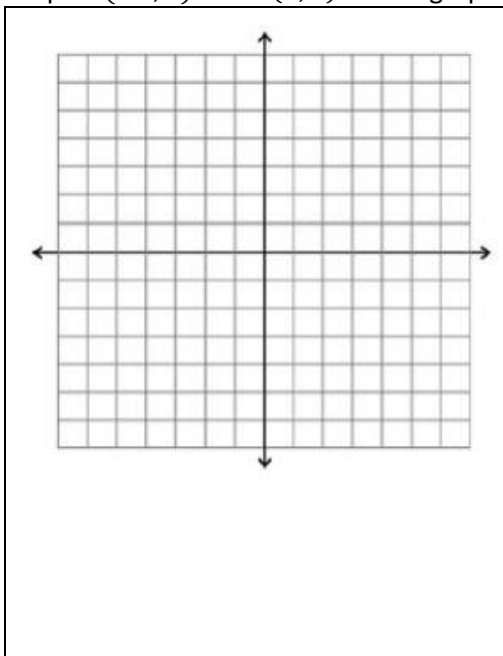
Graph  $A(0, 2)$  and  $B(3, 0)$  on the graphs below. Dilate  $AB$  through the origin with a scale factor of  $r = 2$ .



- $\overline{AB}$  is \_\_\_\_\_ to  $\overline{A'B'}$ .
- What is the slope of  $\overline{AB}$ ? What is the y-intercept?
- What is the slope of  $\overline{A'B'}$ ? What is the y-intercept?
- When the center of dilation is \_\_\_\_\_ the line, the pre-image and the image are \_\_\_\_\_.
- The lines have the same \_\_\_\_\_ but different \_\_\_\_\_.

**SCENARIO #2: CENTER OF DILATION ON THE LINE**

Graph  $A(-2, 0)$  and  $B(3, 0)$  on the graphs below. Dilate  $AB$  through the origin with a scale factor of  $r = 2$ .



- $\overline{AB}$  and  $\overline{A'B'}$  are part of the \_\_\_\_\_.
- What is the slope of  $\overline{AB}$ ? What is the y-intercept?
- What is the slope of  $\overline{A'B'}$ ? What is the y-intercept?
- When the center of dilation is \_\_\_\_\_ the line, the pre-image and the image are part of the \_\_\_\_\_.
- The lines have the same \_\_\_\_\_ and the same \_\_\_\_\_.

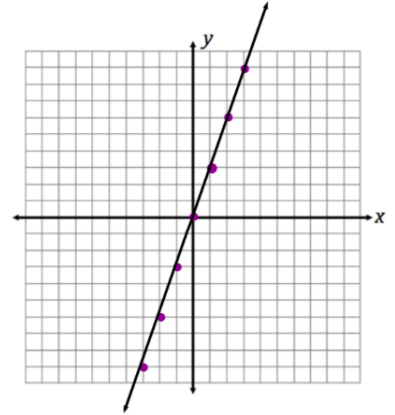
## DILATING LINESEGMENTS

### STEPS:

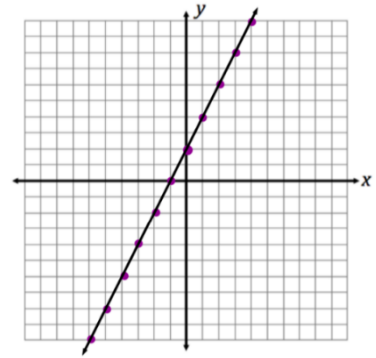
\*\*RECALL: The equation of a line: \_\_\_\_\_  
Where  $m =$  \_\_\_\_\_ and  $b =$  \_\_\_\_\_\*\*

1. Sketch the line and identify if the center of dilation is **ON** or **OFF** the line.
2. If the center of dilation is **ON** the line, the equation remains exactly the same.
3. If the center of dilation is **OFF** the line, the equation will have the same slope but a different y-intercept.  
To find the new y-intercept, **multiply** the original y-intercept by the scale factor.

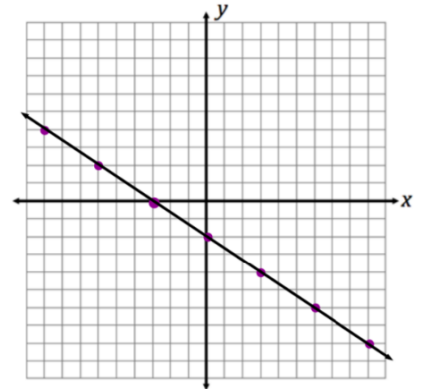
1. The line  $y = 3x$  is dilated by a scale factor of 2 and centered at the origin. Write the equation that represents the image of the line after the dilation.



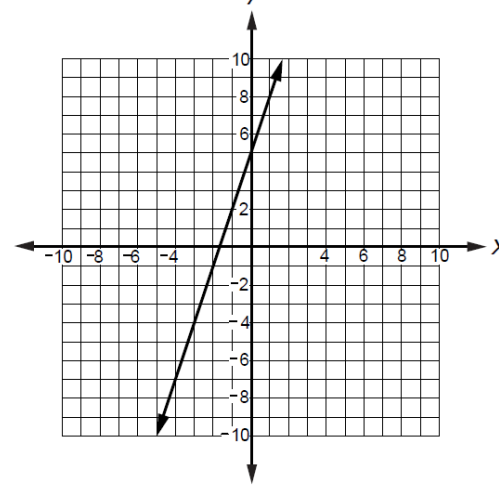
2. The line  $y = 2x + 2$  is dilated by a scale factor of 3 and centered at the origin. Write the equation that represents the image of the line after the dilation.



3. The line  $y = -\frac{2}{3}x - 2$  is graphed to the below. Write the equation of the image of this line after a dilation of 2.5 centered at the origin.

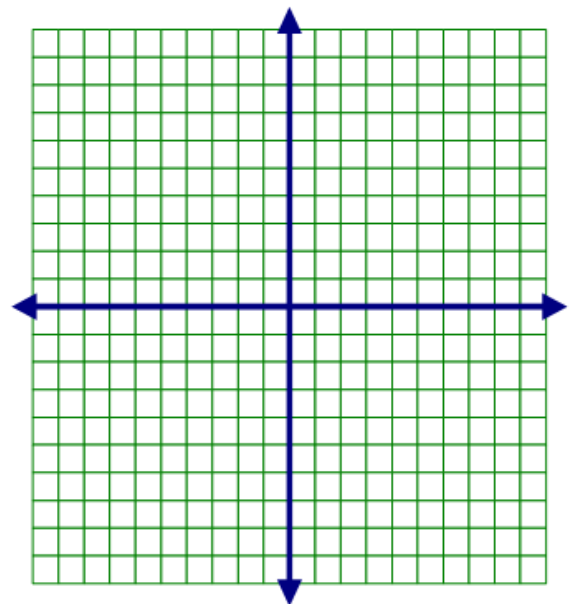


4. Rosa graphs the line  $y = 3x + 5$ . Then she dilates the line by a factor of  $\frac{1}{5}$  with  $(0, 7)$  as the center of dilation. Write the equation that represents the image of the line after the dilation.

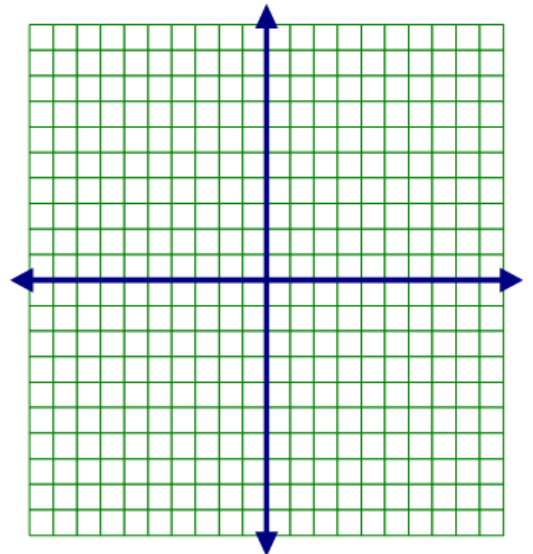


5. Line  $y = 3x - 1$  is transformed by a dilation with a scale factor of 2 and centered at  $(3, 8)$ . The line's image is

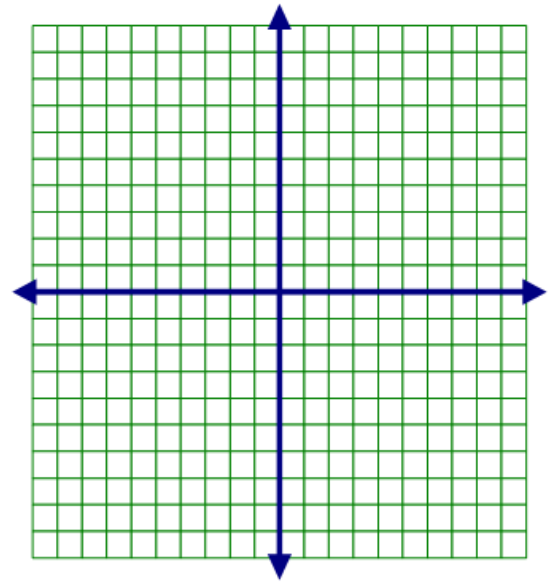
- 1)  $y = 3x - 8$
- 2)  $y = 3x - 4$
- 3)  $y = 3x - 2$
- 4)  $y = 3x - 1$



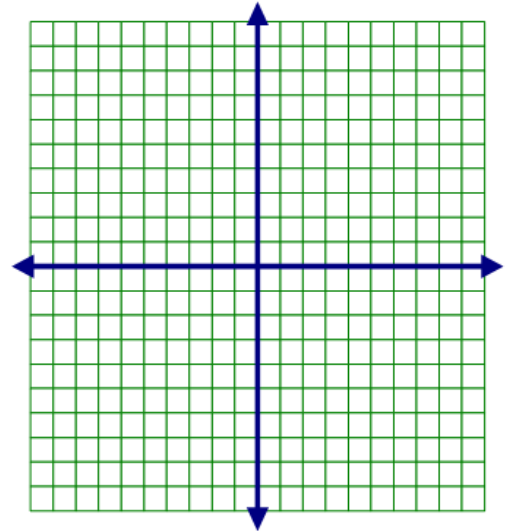
6. The line  $y = 2x + 3$  is dilated by a scale factor of 3 and centered at  $(0, 3)$ . Write the equation that represents the image of the line after the dilation.



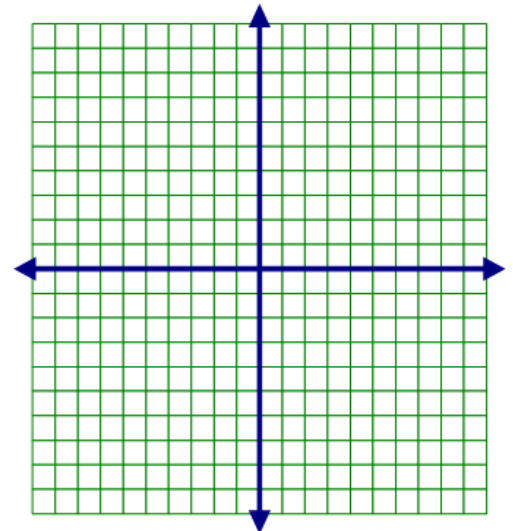
7. The line  $y = 2x + 3$  is dilated by a scale factor of 3 and centered at  $(0,0)$ . Write the equation that represents the image of the line after the dilation.



8. The line  $y = 5x - 1$  is dilated by a scale factor of  $\frac{3}{2}$  and centered at  $(0,0)$ . Write the equation that represents the image of the line after the dilation.



9. The line  $y = \frac{1}{2}x - 5$  is dilated by a scale factor of 3 and centered at  $(0, -5)$ . Write the equation that represents the image of the line after the dilation.



10. Point  $O$  is not on  $\overline{AB}$ . When  $\overline{AB}$  is dilated with the center of dilation at  $O$  with a positive scale factor, image  $\overline{A'B'}$  is shorter than  $\overline{AB}$ . What must be true about the scale factor?

(1) The scale factor is  $k > 1$

(3) The scale factor is  $0 < k < 1$

(2) The scale factor is  $k = 1$

(4) The lengths of  $\overline{AB}$  and  $\overline{A'B'}$  are not related to scale factor  $k$ .

11.  $\overline{AB}$ , shown in the graph to the below, is dilated with a center of dilation at the origin and a scale factor of  $\frac{5}{2}$ .

Which of the following statements regarding  $\overline{AB}$  is **not** true?

(1)  $\overline{AB}$  will be parallel to  $\overline{A'B'}$

(2)  $\overline{A'B'}$  is an enlargement of  $\overline{AB}$

(3)  $AB = \frac{5}{2}A'B'$

(4) The coordinates of  $A'$  will be  $(-5, 2.5)$

