

DO NOW

The coordinates of the endpoints of \overline{AB} are $A(2,3)$ and $B(5,-1)$. Determine the length of $\overline{A'B'}$, the image of \overline{AB} , after a dilation of $\frac{1}{2}$ centered at the origin.

$$AB = \sqrt{(2-5)^2 + (3-(-1))^2}$$

$$AB = \sqrt{25}$$

$$AB = 5$$

$$5 \cdot \frac{1}{2}$$

$$\overline{A'B'} = 2.5$$

Dilations of a Line on a Graph

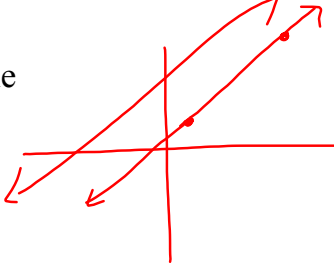
If center of dilation is NOT ON THE LINE:

- Parallel to the original (same slope)
- Calculate other points on the line using the center and scale factor given

If center of dilation is ON THE LINE, the image is the SAME LINE

1) A line that passes through the points whose coordinates are (1, 1) and (5, 7) is dilated by a scale factor of 3 and centered at the origin. The image of the line

- ~~(1)~~ is perpendicular to the original line
- (2) is parallel to the original line
- (3) passes through the origin
- (4) is the original line



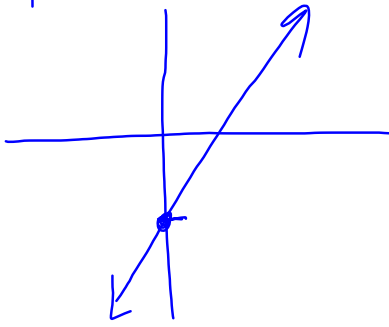
2) The line $y = 2x - 4$ is dilated by a scale factor of $\frac{3}{2}$ and centered at the origin. Which equation represents the image of the line after the dilation?

- ~~(1)~~ $y = 2x - 4$
- (2) $y = 2x - 6$
- ~~(3)~~ $y = 3x - 4$
- ~~(4)~~ $y = 3x - 6$

Handwritten work for question 2:

$0 = 2(0) - 4$
 $0 \neq -4$

$-4 \left(\frac{3}{2}\right) = -6$



3) 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) $y = 3x - 1$

Handwritten work for question 3:

Is (3, 8) on $y = 3x - 1$?
 $8 = 3(3) - 1$
 $8 = 9 - 1$
 $8 = 8$

$0 \neq 8$
 $3(0) = -2(0) + 8$

4) The line $3y = -2x + 8$ is transformed by a dilation centered at the origin. Which linear equation could be its image?

- (1) $2x + 3y = 5$
- ~~(2)~~ $2x - 3y = 5$
- ~~(3)~~ $3x + 2y = 5$
- ~~(4)~~ $3x - 2y = 5$

Handwritten work for question 4:

$y = -\frac{2}{3}x + \frac{8}{3}$

$y = \frac{2}{3}x - \frac{5}{3}$

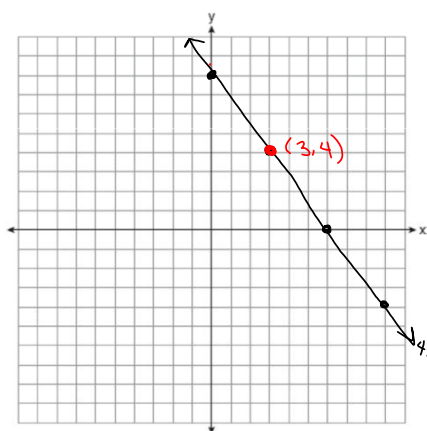
$y = -\frac{2}{3}x + \frac{8}{3}$

$y = \frac{3}{2}x - \frac{5}{2}$

- 5) Aliyah says that when the line $4x + 3y = 24$ is dilated by a scale factor of 2 centered at the point $(3,4)$, the equation of the dilated line is

$$y = -\frac{4}{3}x + 16. \text{ Is Aliyah correct? Explain why.}$$

[The use of the set of axes below is optional.]



$$\begin{array}{r} 4x + 3y = 24 \\ -4x \quad -4x \\ \hline 3y = -4x + 24 \\ \frac{3y}{3} = \frac{-4x}{3} + \frac{24}{3} \\ y = -\frac{4}{3}x + 8 \end{array}$$

No \rightarrow the equation of the line will not change because the center of dilation $(3,4)$ is on the line $4x + 3y = 24$