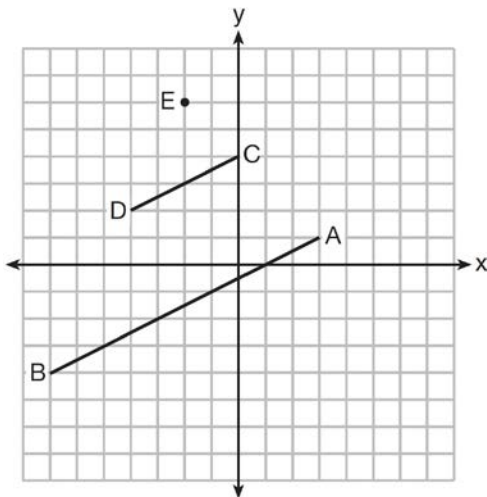


G.SRT.A.1: Line Dilations 1b

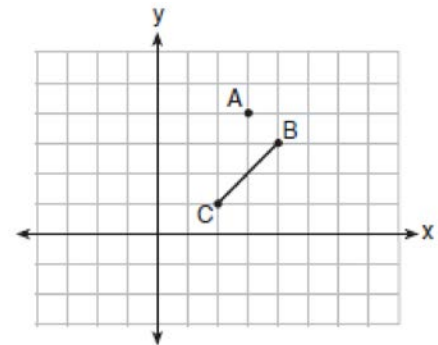
- 1 A three-inch line segment is dilated by a scale factor of 6 and centered at its midpoint. What is the length of its image?
- 2 Line segment $A'B'$, whose endpoints are $(4, -2)$ and $(16, 14)$, is the image of \overline{AB} after a dilation of $\frac{1}{2}$ centered at the origin. What is the length of \overline{AB} ?
- 3 In the diagram below, \overline{CD} is the image of \overline{AB} after a dilation of scale factor k with center E .



Which ratio is equal to the scale factor k of the dilation?

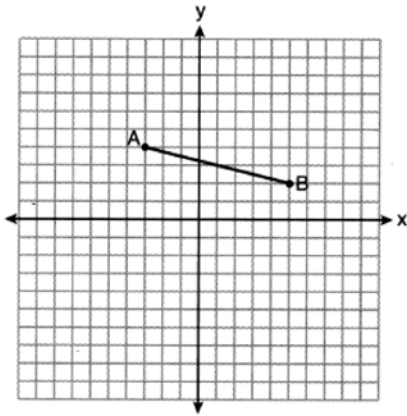
- 4 After a dilation centered at the origin, the image of \overline{CD} is $\overline{C'D'}$. If the coordinates of the endpoints of these segments are $C(6, -4)$, $D(2, -8)$, $C'(9, -6)$, and $D'(3, -12)$, the scale factor of the dilation is

- 5 After a dilation with center $(0, 0)$, the image of \overline{DB} is $\overline{D'B'}$. If $DB = 4.5$ and $D'B' = 18$, the scale factor of this dilation is
- 6 The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?
- 7 On the graph below, point $A(3, 4)$ and \overline{BC} with coordinates $B(4, 3)$ and $C(2, 1)$ are graphed.



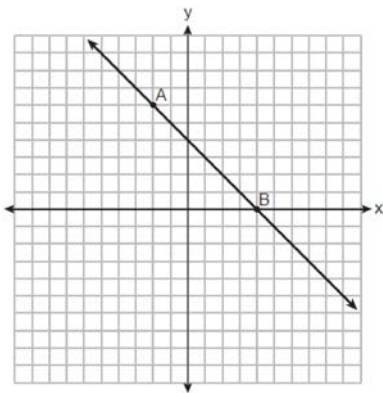
What are the coordinates of B' and C' after \overline{BC} undergoes a dilation centered at point A with a scale factor of 2?

- 8 On the set of axes below, the endpoints of \overline{AB} have coordinates $A(-3,4)$ and $B(5,2)$.



If \overline{AB} is dilated by a scale factor of 2 centered at $(3,5)$, what are the coordinates of the endpoints of its image, $\overline{A'B'}$?

- 9 On the set of axes below, \overleftrightarrow{AB} is drawn and passes through $A(-2,6)$ and $B(4,0)$.



If \overleftrightarrow{CD} is the image of \overleftrightarrow{AB} after a dilation with a scale factor of $\frac{1}{2}$ centered at the origin, which equation represents \overleftrightarrow{CD} ?

- 10 The equation of line h is $2x + y = 1$. Line m is the image of line h after a dilation of scale factor 4 with respect to the origin. What is the equation of the line m ?
- 11 The equation of line t is $3x - y = 6$. Line m is the image of line t after a dilation with a scale factor of $\frac{1}{2}$ centered at the origin. What is an equation of the line m ?
- 12 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?
- 13 What is an equation of the image of the line $y = \frac{3}{2}x - 4$ after a dilation of a scale factor of $\frac{3}{4}$ centered at the origin?
- 14 The line whose equation is $6x + 3y = 3$ is dilated by a scale factor of 2 centered at the point $(0,0)$. An equation of its image is
- 15 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
- 16 Line MN is dilated by a scale factor of 2 centered at the point $(0,6)$. If \overleftrightarrow{MN} is represented by $y = -3x + 6$, which equation can represent $\overleftrightarrow{M'N'}$, the image of \overleftrightarrow{MN} ?

G.SRT.A.1: Line Dilations 1b**Answer Section**

1 ANS:

18 inches

$$3 \times 6 = 18$$

REF: 061602geo

2 ANS:

40

$$\sqrt{(32-8)^2 + (28-(-4))^2} = \sqrt{576 + 1024} = \sqrt{1600} = 40$$

REF: 081621geo

3 ANS:

$$\frac{EC}{EA}$$

REF: 061518geo

4 ANS:

$$\frac{3}{2}$$

$$\frac{9}{6} = \frac{3}{2}$$

REF: 061905geo

5 ANS:

4

$$\frac{18}{4.5} = 4$$

REF: 011901geo

6 ANS:

$$k = \frac{1}{2}$$

$$y = \frac{1}{2}x + 4 \quad \frac{2}{4} = \frac{1}{2}$$

$$y = \frac{1}{2}x + 2$$

REF: 012008geo

7 ANS:

 $B'(5,2)$ and $C'(1,-2)$

$$B: (4-3, 3-4) \rightarrow (1,-1) \rightarrow (2,-2) \rightarrow (2+3, -2+4)$$

$$C: (2-3, 1-4) \rightarrow (-1,-3) \rightarrow (-2,-6) \rightarrow (-2+3, -6+4)$$

REF: 011713geo

8 ANS:

 $A'(-9,3)$ and $B'(7,-1)$ $A: (-3-3, 4-5) \rightarrow (-6,-1) \rightarrow (-12,-2) \rightarrow (-12+3, -2+5)$ $B: (5-3, 2-5) \rightarrow (2,-3) \rightarrow (4,-6) \rightarrow (4+3, -6+5)$

REF: 012322geo

9 ANS:

 $y = -x + 2$

REF: 012416geo

10 ANS:

 $y = -2x + 4$

The given line h , $2x + y = 1$, does not pass through the center of dilation, the origin, because the y -intercept is at $(0,1)$. The slope of the dilated line, m , will remain the same as the slope of line h , -2 . All points on line h , such as $(0,1)$, the y -intercept, are dilated by a scale factor of 4; therefore, the y -intercept of the dilated line is $(0,4)$ because the center of dilation is the origin, resulting in the dilated line represented by the equation $y = -2x + 4$.

REF: spr1403geo

11 ANS:

 $y = 3x - 3$ Another equation of line t is $y = 3x - 6$. $-6 \cdot \frac{1}{2} = -3$

REF: 012319geo

12 ANS:

 $y = 2x - 6$

The line $y = 2x - 4$ does not pass through the center of dilation, so the dilated line will be distinct from $y = 2x - 4$. Since a dilation preserves parallelism, the line $y = 2x - 4$ and its image will be parallel, with slopes of 2. To obtain the y -intercept of the dilated line, the scale factor of the dilation, $\frac{3}{2}$, can be applied to the y -intercept,

$(0,-4)$. Therefore, $\left(0 \cdot \frac{3}{2}, -4 \cdot \frac{3}{2}\right) \rightarrow (0,-6)$. So the equation of the dilated line is $y = 2x - 6$.

REF: fall1403geo

13 ANS:

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

The line $y = \frac{3}{2}x - 4$ does not pass through the center of dilation, so the dilated line will be distinct from

$y = \frac{3}{2}x - 4$. Since a dilation preserves parallelism, the line $y = \frac{3}{2}x - 4$ and its image will be parallel, with slopes of $\frac{3}{2}$. To obtain the y -intercept of the dilated line, the scale factor of the dilation, $\frac{3}{4}$, can be applied to the

y -intercept, $(0, -4)$. Therefore, $\left(0 \cdot \frac{3}{4}, -4 \cdot \frac{3}{4}\right) \rightarrow (0, -3)$. So the equation of the dilated line is $y = \frac{3}{2}x - 3$.

REF: 011924geo

14 ANS:

$$y = -2x + 2$$

$$3y = -6x + 3$$

$$y = -2x + 1$$

REF: 062319geo

15 ANS:

$$y = 3x - 1$$

The line $y = 3x - 1$ passes through the center of dilation, so the dilated line is not distinct.

REF: 081524geo

16 ANS:

$$y = -3x + 6$$

The line $y = -3x + 6$ passes through the center of dilation, so the dilated line is not distinct.

REF: 061824geo