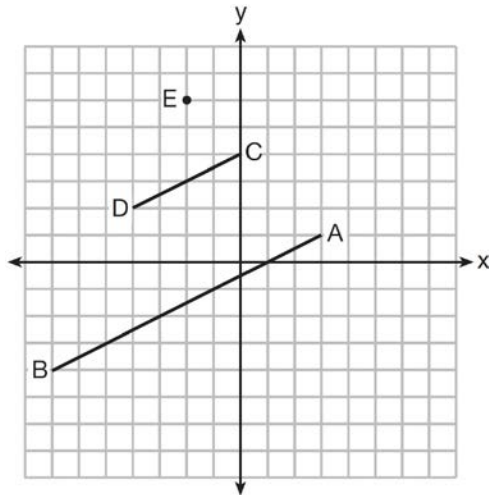


G.SRT.A.1: Line Dilations 1a

- 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?
 - 1) 9 inches
 - 2) 2 inches
 - 3) 15 inches
 - 4) 18 inches

- 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} ?
 - 1) 5
 - 2) 10
 - 3) 20
 - 4) 40

- 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?

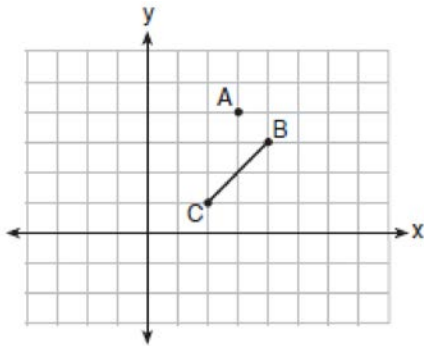
- 1) $\frac{EC}{EA}$
- 2) $\frac{BA}{EA}$
- 3) $\frac{EA}{BA}$
- 4) $\frac{EA}{EC}$

- 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
 - 1) $\frac{3}{2}$
 - 2) $\frac{2}{3}$
 - 3) 3
 - 4) $\frac{1}{3}$

- 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
 - 1) $\frac{1}{5}$
 - 2) 5
 - 3) $\frac{1}{4}$
 - 4) 4

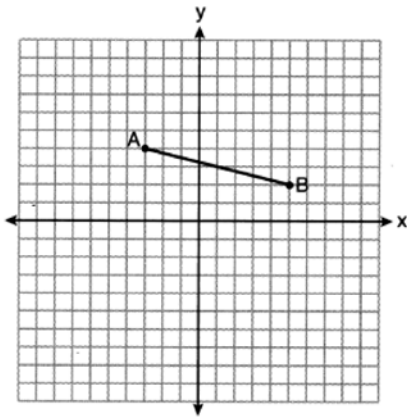
- 6 The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?
 - 1) $k = \frac{1}{2}$
 - 2) $k = 2$
 - 3) $k = \frac{1}{4}$
 - 4) $k = 4$

- 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?

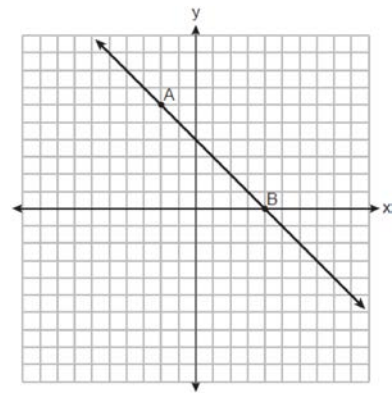
- 1) $B'(5,2)$ and $C'(1,-2)$
 - 2) $B'(6,1)$ and $C'(0,-1)$
 - 3) $B'(5,0)$ and $C'(1,-2)$
 - 4) $B'(5,2)$ and $C'(3,0)$
- 8 On the set of axes below, the endpoints of \overline{AB} have coordinates $A(-3,4)$ and $B(5,2)$.



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, $\overline{A'B'}$?

- 1) $A'(-7,5)$ and $B'(9,1)$
- 2) $A'(-1,6)$ and $B'(7,4)$
- 3) $A'(-6,8)$ and $B'(10,4)$
- 4) $A'(-9,3)$ and $B'(7,-1)$

- 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} ?

- 1) $y = -x + 4$
 - 2) $y = -x + 2$
 - 3) $y = -\frac{1}{2}x + 4$
 - 4) $y = -\frac{1}{2}x + 2$
- 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 ?
- 1) $y = -2x + 1$
 - 2) $y = -2x + 4$
 - 3) $y = 2x + 4$
 - 4) $y = 2x + 1$
- 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 ?

- 1) $y = \frac{3}{2}x - 3$
- 2) $y = \frac{3}{2}x - 6$
- 3) $y = 3x + 3$
- 4) $y = 3x - 3$

- 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?
- 1) $y = 2x - 4$
 - 2) $y = 2x - 6$
 - 3) $y = 3x - 4$
 - 4) $y = 3x - 6$
- 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?
- 1) $y = \frac{9}{8}x - 4$
 - 2) $y = \frac{9}{8}x - 3$
 - 3) $y = \frac{3}{2}x - 4$
 - 4) $y = \frac{3}{2}x - 3$
- 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
- 1) $y = -2x + 1$
 - 2) $y = -2x + 2$
 - 3) $y = -4x + 1$
 - 4) $y = -4x + 2$
- 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
- 1) $y = 3x - 8$
 - 2) $y = 3x - 4$
 - 3) $y = 3x - 2$
 - 4) $y = 3x - 1$
- 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} ?
- 1) $y = -3x + 12$
 - 2) $y = -3x + 6$
 - 3) $y = -6x + 12$
 - 4) $y = -6x + 6$

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

1 ANS: 4
 $3 \times 6 = 18$

REF: 061602geo

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

REF: 081621geo

3 ANS: 1 REF: 061518geo

4 ANS: 1
 $\frac{9}{6} = \frac{3}{2}$

REF: 061905geo

5 ANS: 4
 $\frac{18}{4.5} = 4$

REF: 011901geo

6 ANS: 1
 $y = \frac{1}{2}x + 4$ $\frac{2}{4} = \frac{1}{2}$
 $y = \frac{1}{2}x + 2$

REF: 012008geo

7 ANS: 1
 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: 4
 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: 2 REF: 012416geo

10 ANS: 2

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: 4

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

REF: 012319geo

12 ANS: 2

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: 4

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: 2

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

$$y = -2x + 1$$

REF: 062319geo

15 ANS: 4

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

REF: 081524geo

16 ANS: 2

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

REF: 061824geo