# G.SRT.A.2: Dilations 2

1 If the dilation $D_k$ is an isometry, what must be the value of $k$?
1) 1
2) 2
3) –2
4) 0

2 What are the coordinates of the point $(2,-4)$ under the dilation $D_{-2}$?
1) $(8,-4)$
2) $(4,-8)$
3) $(-8,4)$
4) $(-4,8)$

3 What are the coordinates of point $(-1,4)$ under dilation $D_{-2}$?
1) $(-2,8)$
2) $(2,-8)$
3) $(-8,2)$
4) $(8,-2)$

4 Find the image of $(3,-2)$ under the dilation $D_2$.

5 What is the image of point $A(1,3)$ after a dilation with the center at the origin and a scale factor of 4?

6 If $P(4,-3)$ is transformed under the dilation $D_{-2}$, what is the image of $P'$?

7 Find the image of $A(-3,2)$ under a dilation with the center at the origin and a scale factor of –2.

8 In which quadrant would the image of point $(5,-3)$ fall after a dilation using a factor of –3?
1) I
2) II
3) III
4) IV

9 In which quadrant will the image of $A(4,-2)$ lie after dilation $D_{-2}$?

10 The image of point $A$ after a dilation of 3 is $(6,15)$. What was the original location of point $A$?
1) $(2,5)$
2) $(3,12)$
3) $(9,18)$
4) $(18,45)$

11 If the image of $A$ after a dilation of $-2$ is $A'(-8,6)$, what are the coordinates of $A$?
1) $(4,-3)$
2) $(-4,3)$
3) $(16,-12)$
4) $(-16,12)$

12 The point $A(6,3)$ maps onto $A'(2,1)$ under a dilation with respect to the origin. What is the constant of dilation?
1) $\frac{1}{3}$
2) $\frac{1}{2}$
3) 3
4) –2

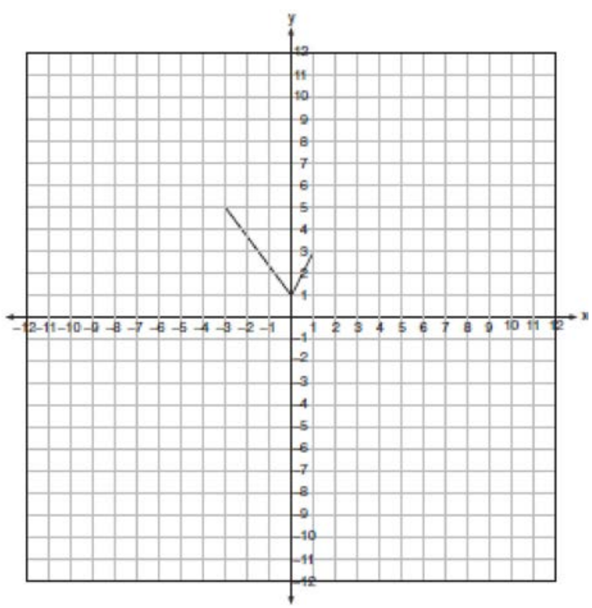
13 Under a dilation with respect to the origin, the image of $P(-15,6)$ is $P'(-5,2)$. What is the constant of dilation?
1) –4
2) $\frac{1}{3}$
3) 3
4) 10

14 If the dilation $D_k(-2,4)$ equals $(1,-2)$, the scale factor $k$ is equal to
1) $\frac{1}{2}$
2) 2
3) $-\frac{1}{2}$
4) –2

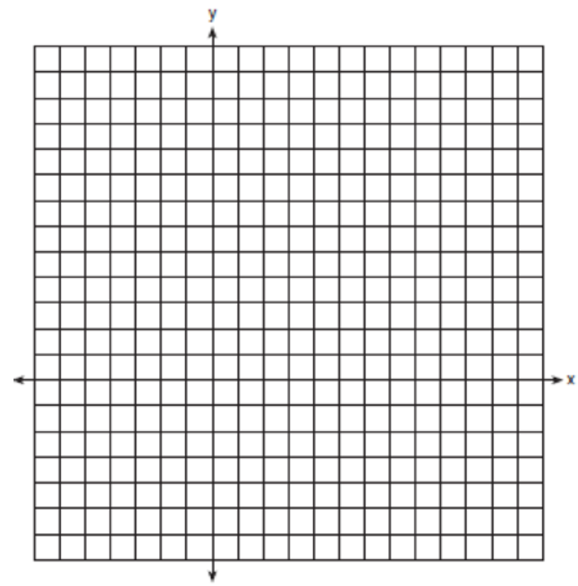
15 Under a dilation where the center of dilation is the origin, the image of $A(-2,-3)$ is $A'(-6,-9)$. What are the coordinates of $B'$, the image of $B(4,0)$ under the same dilation?
1) $(-12,0)$
2) $(12,0)$
3) $(-4,0)$
4) $(4,0)$

16 Triangle $A'B'C'$ is the image of $\triangle ABC$ under a dilation such that $A'B' = 3AB$. Triangles $ABC$ and $A'B'C'$ are
1) congruent but not similar
2) similar but not congruent
3) both congruent and similar
4) neither congruent nor similar

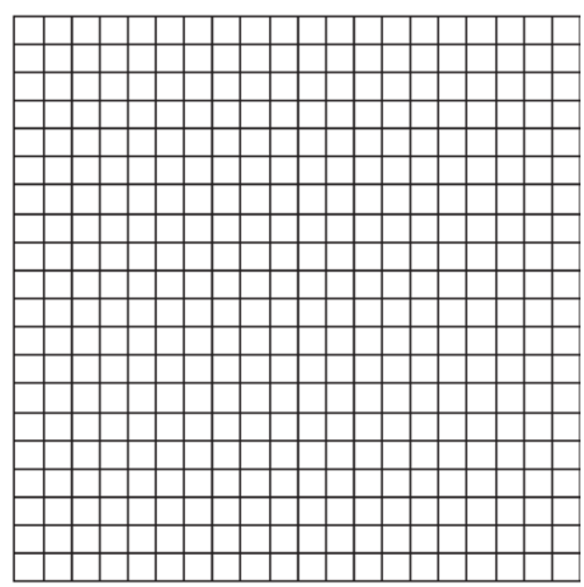
17 The graph of the function $g(x)$ is shown on the accompanying set of axes. On the same set of axes, sketch the image of $g(x)$ under the transformation $D_2$.



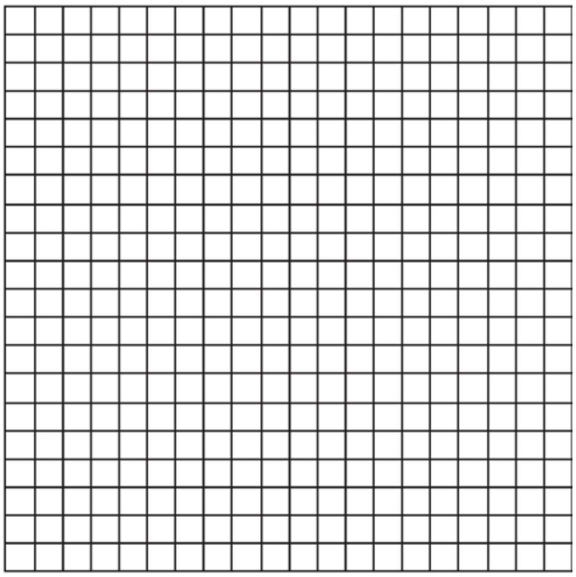

18 On the accompanying set of axes, graph $\triangle ABC$ with coordinates $A(-1,2)$, $B(0,6)$, and $C(5,4)$. Then graph $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of 2.




19 On the accompanying grid, graph and label quadrilateral $ABCD$, whose coordinates are $A(-1,3)$, $B(2,0)$, $C(2,-1)$, and $D(-3,-1)$. Graph, label, and state the coordinates of $A'B'C'D'$, the image of $ABCD$ under a dilation of 2, where the center of dilation is the origin.



20 Given: quadrilateral $ABCD$ with vertices $A(-2,2)$, $B(8,-4)$, $C(6,-10)$, and $D(-4,-4)$. State the coordinates of $A'B'C'D'$, the image of quadrilateral $ABCD$ under a dilation of factor $\frac{1}{2}$. Prove that $A'B'C'D'$ is a parallelogram. [The use of the grid is optional.]



21 Using a drawing program, a computer graphics designer constructs a circle on a coordinate plane on her computer screen. She determines that the equation of the circle's graph is $(x-3)^2+(y+2)^2=36$. She then dilates the circle with the transformation $D_3$. After this transformation, what is the center of the new circle?

1) $(6,-5)$
2) $(-6,5)$
3) $(9,-6)$
4) $(-9,6)$

22 The engineering office in the village of Whitesboro has a map of the village that is laid out on a rectangular coordinate system. A traffic circle located on the map is represented by the equation $(x+4)^2+(y-2)^2=81$. The village planning commission asks that the transformation $D_2$ be applied to produce a new traffic circle, where the center of dilation is at the origin. Find the coordinates of the center of the new traffic circle. Find the length of the radius of the new traffic circle.

# G.SRT.A.2: Dilations 2
## Answer Section

1 ANS: 1 REF: 080916b
2 ANS: 4 REF: 069017siii
3 ANS: 2 REF: 060318siii
4 ANS:
$(6,-4)$

REF: 068506siii
5 ANS:
$(4,12)$

REF: 080202siii
6 ANS:
$(-8,6)$

REF: 019014siii
7 ANS:
$(6,-4)$

REF: 069806siii
8 ANS: 2
$(-15,9)$ falls in Quadrant II.

REF: 010311b
9 ANS:
II

REF: 060106siii
10 ANS: 1 REF: 010725a
11 ANS: 1 REF: 019918siii
12 ANS: 1 REF: 061003b
13 ANS: 2

$$P \times \text{constant} = P'$$
$$(-15,6) \times \text{constant} = (-5,2)$$
$$\text{constant} = \frac{1}{3}$$

REF: 080711b
14 ANS: 3 REF: 019416siii

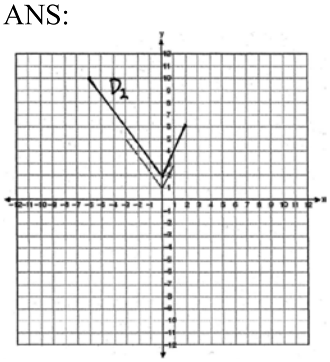
15 ANS: 2

$$A \times \text{constant} = A'$$
$$(-2,-3) \times \text{constant} = (-6,-9). \quad B(4,0) \times 3 = B'(12,0)$$
$$\text{constant} = 3$$

REF: 010803b

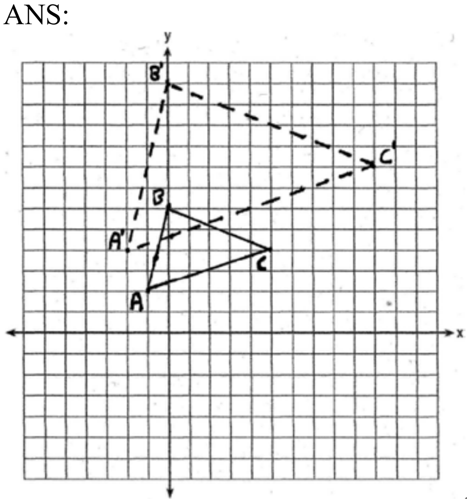
16 ANS: 2 REF: 010302a

17 ANS:




REF: 060521b

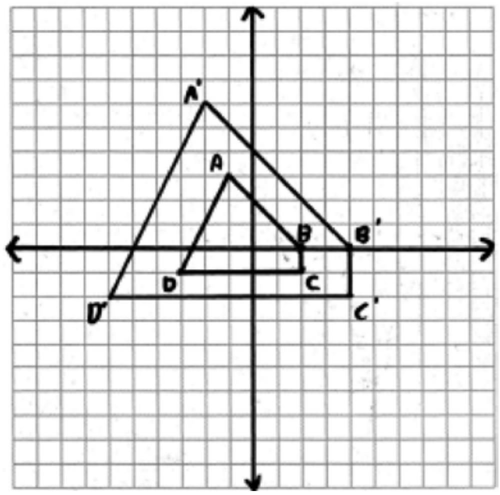
18 ANS:




$A'(-2,4)$, $B'(0,12)$ and $C'(10,8)$

REF: 080128a

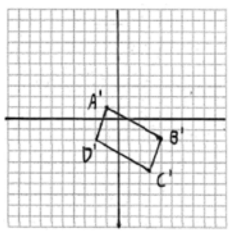
19 ANS:




$A'(-2,6)$, $B'(4,0)$, $C'(4,-2)$, $D'(-6,-2)$

REF: 010937a

20 ANS:




. The coordinates of $A'B'C'D'$, the image of quadrilateral *ABCD* under a dilation of factor $\frac{1}{2}$ are *A'*(-1,1), *B'*(4,-2), *C'*(3,-5) and *D'*(-2,-2). To prove that $A'B'C'D'$ is a parallelogram, show that both pairs of opposite sides of the parallelogram are parallel by showing the opposite sides have the same slope:

$$m_{\overline{A'B'}} = \frac{-2-1}{4-(-1)} = -\frac{3}{5} \quad m_{\overline{A'D'}} = \frac{-2-1}{-2-(-1)} = 3.$$

$$m_{\overline{C'D'}} = \frac{-5-(-2)}{3-(-2)} = -\frac{3}{5} \quad m_{\overline{B'C'}} = \frac{-5-(-2)}{3-4} = 3$$

REF: 060733b

21 ANS: 3

The center of the circle before the dilation is (3,-2).

REF: 060911b

22 ANS:

$(-8,4)$, 18. Before $D_2$, the center is $(-4,2)$ and the radius is 9.

REF: 060831b