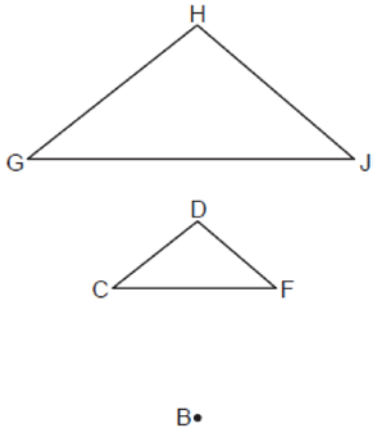
Name: _____

G.SRT.A.2: Dilations 1

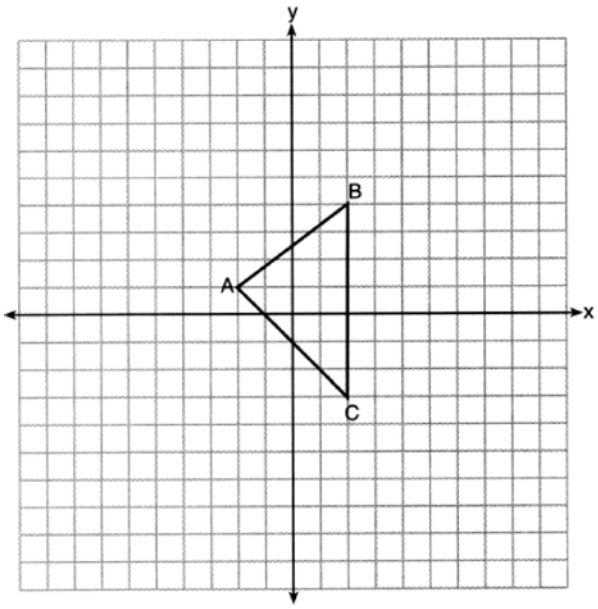
1 In the diagram below, $\triangle GHJ$ is dilated by a scale factor of $\frac{1}{2}$ centered at point B to map onto $\triangle CDF$.



If $m\angle DFC = 40°$, what is $m\angle HJG$?

1) 20°
2) 40°
3) 60°
4) 80°

2 Triangle $A'B'C'$ is the image of $\triangle ABC$ after a dilation centered at the origin. The coordinates of the vertices of $\triangle ABC$ are $A(-2,1)$, $B(2,4)$, and $C(2,-3)$.



If the coordinates of A' are $(-4,2)$, the coordinates of B' are

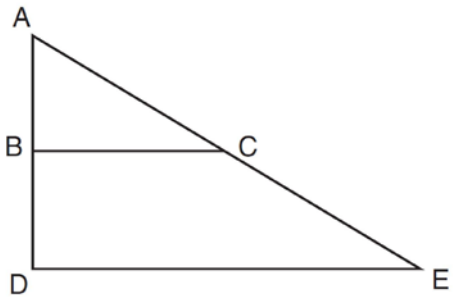
1) $(8,4)$
2) $(4,8)$
3) $(4,-6)$
4) $(1,2)$

3 If $\triangle TAP$ is dilated by a scale factor of 0.5, which statement about the image, $\triangle T'A'P'$, is true?

1) $m\angle T'A'P' = \frac{1}{2}(m\angle TAP)$
2) $m\angle T'A'P' = 2(m\angle TAP)$
3) $TA = 2(T'A')$
4) $TA = \frac{1}{2}(T'A')$

4 If $\triangle ABC$ is dilated by a scale factor of 3, which statement is true of the image $\triangle A'B'C'$?
1) $3A'B' = AB$
2) $B'C' = 3BC$
3) $m\angle A' = 3(m\angle A)$
4) $3(m\angle C') = m\angle C$

5 The image of $\triangle ABC$ after a dilation of scale factor k centered at point A is $\triangle ADE$, as shown in the diagram below.



Which statement is always true?
1) $2\overline{AB} = \overline{AD}$
2) $\overline{AD} \perp \overline{DE}$
3) $\overline{AC} = \overline{CE}$
4) $\overline{BC} \parallel \overline{DE}$

6 Triangle KLM is dilated by a scale factor of 3 to map onto triangle DRS. Which statement is *not* always true?
1) $\angle K \cong \angle D$
2) $KM = \frac{1}{3}DS$
3) The area of $\triangle DRS$ is 3 times the area of $\triangle KLM$.
4) The perimeter of $\triangle DRS$ is 3 times the perimeter of $\triangle KLM$.

7 A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?
1) The area of the image is nine times the area of the original triangle.
2) The perimeter of the image is nine times the perimeter of the original triangle.
3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.
4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.

8 Rectangle $A'B'C'D'$ is the image of rectangle $ABCD$ after a dilation centered at point A by a scale factor of $\frac{2}{3}$. Which statement is correct?
1) Rectangle $A'B'C'D'$ has a perimeter that is $\frac{2}{3}$ the perimeter of rectangle $ABCD$.
2) Rectangle $A'B'C'D'$ has a perimeter that is $\frac{3}{2}$ the perimeter of rectangle $ABCD$.
3) Rectangle $A'B'C'D'$ has an area that is $\frac{2}{3}$ the area of rectangle $ABCD$.
4) Rectangle $A'B'C'D'$ has an area that is $\frac{3}{2}$ the area of rectangle $ABCD$.

9 Triangle RJM has an area of 6 and a perimeter of 12. If the triangle is dilated by a scale factor of 3 centered at the origin, what are the area and perimeter of its image, triangle $R'J'M'$?
1) area of 9 and perimeter of 15
2) area of 18 and perimeter of 36
3) area of 54 and perimeter of 36
4) area of 54 and perimeter of 108

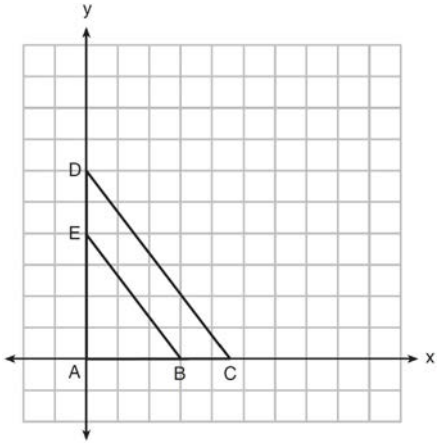
10 Given square $RSTV$, where $RS = 9$ cm. If square $RSTV$ is dilated by a scale factor of 3 about a given center, what is the perimeter, in centimeters, of the image of $RSTV$ after the dilation?

1) 12
2) 27
3) 36
4) 108

11 A rectangle has a width of 3 and a length of 4. The rectangle is dilated by a scale factor of 1.8. What is the area of its image, to the *nearest tenth*?

1) 3.7
2) 6.7
3) 21.6
4) 38.9

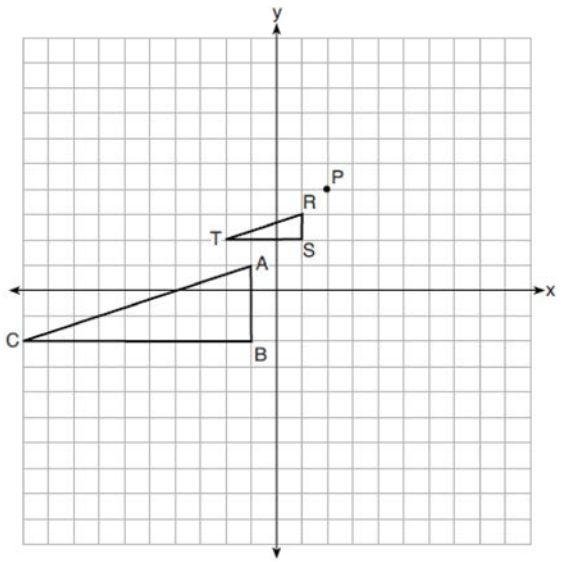
12 In the diagram below, $\triangle ABE$ is the image of $\triangle ACD$ after a dilation centered at the origin. The coordinates of the vertices are $A(0,0)$, $B(3,0)$, $C(4.5,0)$, $D(0,6)$, and $E(0,4)$.



The ratio of the lengths of $\overline{BE}$ to $\overline{CD}$ is

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

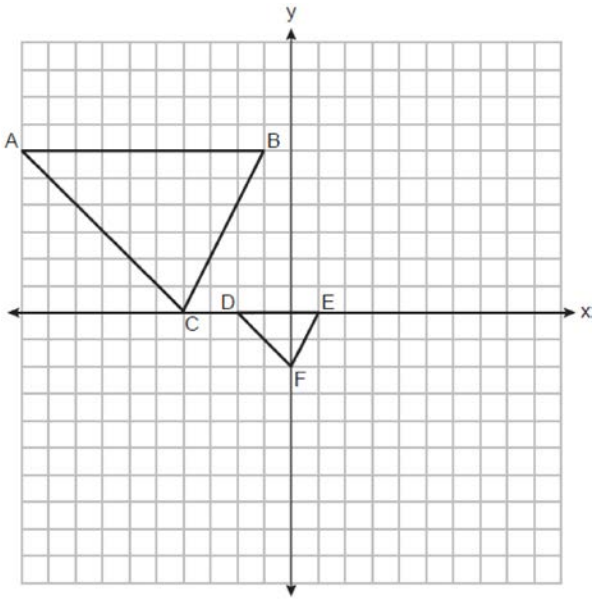
13 On the set of axes below, $\triangle RST$ is the image of $\triangle ABC$ after a dilation centered at point P.



The scale factor of the dilation that maps $\triangle ABC$ onto $\triangle RST$ is

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

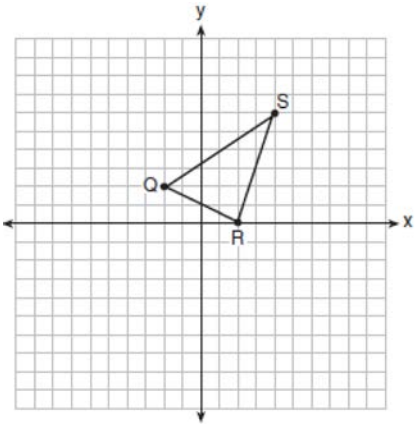
14 On the set of axes below, $\triangle DEF$ is the image of $\triangle ABC$ after a dilation of scale factor $\frac{1}{3}$.



The center of dilation is at
1) $(0,0)$
2) $(2,-3)$
3) $(0,-2)$
4) $(-4,0)$

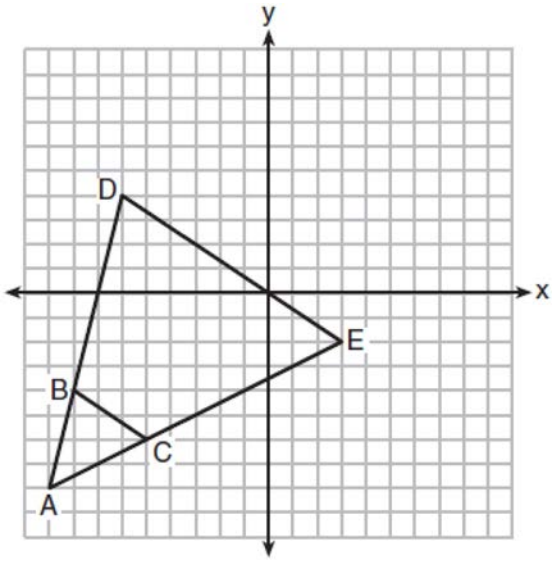
15 Triangle $A'B'C'$ is the image of triangle ABC after a dilation with a scale factor of $\frac{1}{2}$ and centered at point A. Is triangle ABC congruent to triangle $A'B'C'$? Explain your answer.

16 Triangle QRS is graphed on the set of axes below.



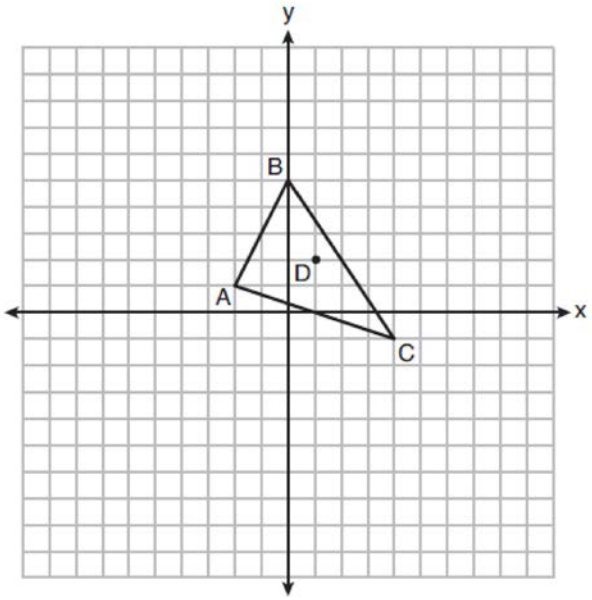
On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin. Use slopes to explain why $Q'R' \parallel QR$.

17 Triangle ABC and triangle ADE are graphed on the set of axes below.



Describe a transformation that maps triangle ABC onto triangle ADE. Explain why this transformation makes triangle ADE similar to triangle ABC.

18 Triangle ABC and point $D(1,2)$ are graphed on the set of axes below.



Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$, after a dilation of scale factor 2 centered at point D.

G.SRT.A.2: Dilations 1
Answer Section

1 ANS: 2 REF: 012409geo

2 ANS: 2

$$\frac{(-4,2)}{(-2,1)} = 2$$

REF: 062201geo

3 ANS: 3

(1) and (2) are false as dilations preserve angle measure. (4) would be true if the scale factor was 2.

REF: 082323geo

4 ANS: 2 REF: 061516geo

5 ANS: 4 REF: 081506geo

6 ANS: 3 REF: 062414geo

7 ANS: 1

$3^2 = 9$

REF: 081520geo

8 ANS: 1 REF: 011811geo

9 ANS: 3

$6 \cdot 3^2 = 54 \;\; 12 \cdot 3 = 36$

REF: 081823geo

10 ANS: 4

$9 \cdot 3 = 27, 27 \cdot 4 = 108$

REF: 061805geo

11 ANS: 4

$(3)(4)(1.8)^2 \approx 38.9$

REF: 082420geo

12 ANS: 1

$$\frac{4}{6} = \frac{3}{4.5} = \frac{2}{3}$$

REF: 081523geo

13 ANS: 1

$$\frac{1}{3}, \frac{3}{9}, \frac{\sqrt{10}}{\sqrt{90}}$$

REF: 082206geo

14 ANS: 2

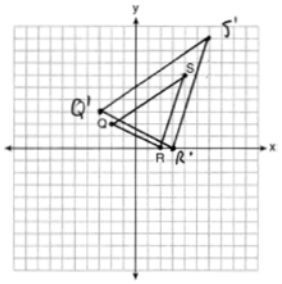
$$x_0 = \frac{kx_1 - x_2}{k-1} = \frac{\frac{1}{3}(-4) - 0}{\frac{1}{3} - 1} = \frac{\frac{-4}{3}}{\frac{-2}{3}} = 2 \quad y_0 = \frac{ky_1 - y_2}{k-1} = \frac{\frac{1}{3}(0) - -2}{\frac{1}{3} - 1} = \frac{2}{\frac{-2}{3}} = -3$$

REF: 062313geo

15 ANS:
No, because dilations do not preserve distance.

REF: 061925geo

16 ANS:



A dilation preserves slope, so the slopes of $\overline{QR}$ and $\overline{Q'R'}$ are equal. Because the slopes are equal, $Q'R' \parallel QR$.

REF: 011732geo

17 ANS:
A dilation of 3 centered at A. A dilation preserves angle measure, so the triangles are similar.

REF: 011832geo

18 ANS:
$A(-2,1) \rightarrow (-3,-1) \rightarrow (-6,-2) \rightarrow (-5,0)$, $B(0,5) \rightarrow (-1,3) \rightarrow (-2,6) \rightarrow (-1,8)$,
$C(4,-1) \rightarrow (3,-3) \rightarrow (6,-6) \rightarrow (7,-4)$

REF: 061826geo