## 1.8 Dilations with Origin Center

KEY
Geometry

**Directions: Write the rule of the transformation.**

1) A segment AB is dilated by a scale factor of 5

$AB\ (x,y) \rightarrow A'B'\ (5x, 5y)$

2) A triangle DEF is dilated by a scale factor of $\frac{1}{4}$

$DEF\ (x,y) \rightarrow D'E'F'\ (\frac{1}{4}x, \frac{1}{4}y)$

3) A square MNOP is stretched horizontally by a scale factor of 1.25

$MNOP\ (x,y) \rightarrow M'N'O'P'\ (1.25x, y)$

4) A line segment JK is stretched vertically by a scale factor of 3

$JK\ (x,y) \rightarrow J'K'\ (x, 3y)$

**Directions: Describe the transformation. (This is a mixed review).**

5) $(x, y) \rightarrow '(-y, -x)$

REFLECTION ACROSS $y = -x$

6) $(x, y) \rightarrow '(5x, 5y)$

DILATION BY SF of 5

7) $(x, y) \rightarrow '(3x, y)$

HORIZONTAL STRETCH BY SF of 3

8) $(x, y) \rightarrow '\left(\frac{x}{5}, \frac{y}{5}\right)$

DILATION BY SF of $\frac{1}{5}$

9) $(x, y) \rightarrow '(x + 8, y)$

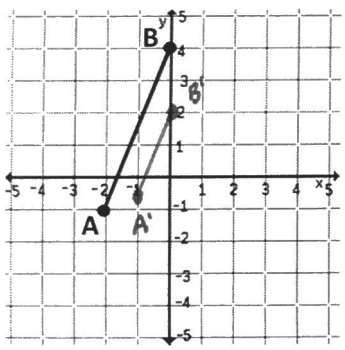
RIGHT 8

*10) $(x, y) \rightarrow '' (3x + 2, y - 3)$

HORIZONTAL STRETCH BY SF of 3
RIGHT 2
DOWN 3

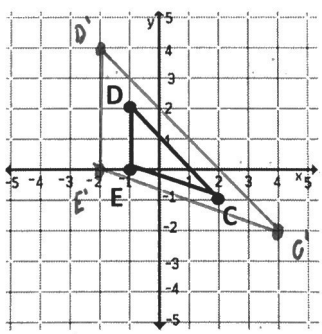
**Directions: Complete the transformation of the new image. If the rule was provide, describe the transformation. If the transformation was described, write the rule.**

11) $AB(x, y) \rightarrow A'B'\left(\frac{1}{2}x, \frac{1}{2}y\right)$



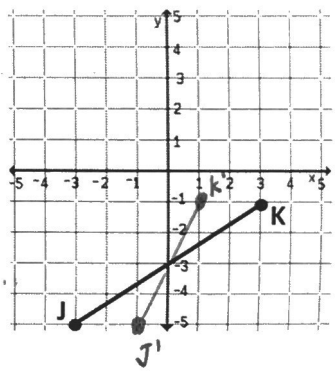

DILATION BY SF of $\frac{1}{2}$

12) CDE $(x, y) \rightarrow C'D'E'$ $(2x, 2y)$



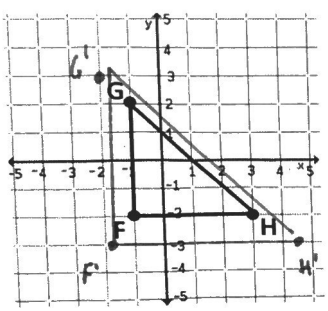

DILATION BY SF of 2

13) $JK(x, y) \rightarrow J'K'\left(\frac{x}{3}, y\right)$



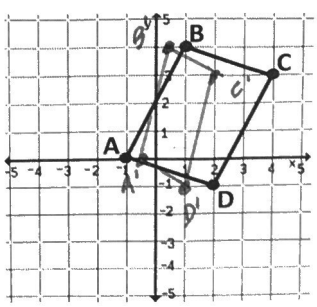

HORIZONTAL SHRINK BY SF of $\frac{1}{3}$

14) Dilate FGH by a scale factor of 1.5



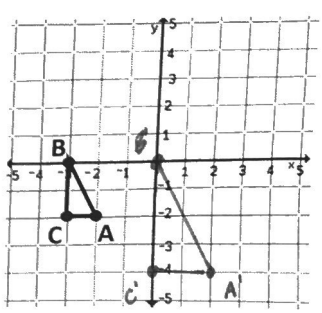

$FGH\ (x,y) \rightarrow F'G'H'\ (1.5x, 1.5y)$

15) Horizontally shrink ABCD by a scale factor of ½




$ABCD(x, y) \rightarrow A'B'C'D'\ (\frac{1}{2}x, y)$

*16) Translate ABC 3 units right, then dilate by a s. f. of 2




$ABC\ (x,y) \rightarrow A'B'C'\ (2x+6, 2y)$

**Directions: Find the missing point using the given information.**

17) A(0, –6)
Rule: (x, y) → '($\frac{2}{3}$ x, $\frac{2}{3}$ y)
Find A'.

A' = (0, -4)

18) B'(7, –2)
Description: Dilate by 0.2
Find B.

B = (35, -10)

19) Pre-Image: (8, 1)
Description: Horizontal shrink by $\frac{1}{4}$
Find the image.

(2, 1)

20) Image: (–2, –40)
Rule: (x, y) → '(5x, 5y)
Find the pre-image.

PRE-IMAGE = $\left(\frac{-2}{5}, -8\right)$

**Directions: Solve each problem.**

21) A triangle has vertices of M(0, 0), A(0, 15), and R(–20, 0). After a dilation, ΔMAR has two image coordinates of M'(0, 0) and R'(–50, 0). What is the ordered pair that represents A'?

$\Delta MAR(x, y) \rightarrow \Delta M'A'R'(2.5x, 2.5y)$

$A' = (0, 37.5)$

22) In the rule, (x, y)→'(x, 8y), what transformation has occurred?

VERTICAL STRETCH BY SF OF 8

23) Meg was given the following rule: (x, y)→''(–5x, –5y). Meg states that the type of transformation that has occurred is a dilation by a scale factor of –5.

a) Can a negative sign be used to describe a dilation?

NO

b) Explain the role of the negative symbol in this sequence of transformations.

ROTATION OF 180 CW/CCW ABOUT THE ORIGIN

24) B''(5, 12) was produced after a horizontal shrink of $\frac{1}{2}$ and a vertical stretch of 4. What is the ordered pair that represents the pre-image, B?

B = (10, 3)