

Name: _____

Geometry—Section 9-5: Dilations

A **dilation** is a transformation that produces an image that is the **same shape** as the original, but is a **different size**. A dilation stretches or shrinks the original figure.

The description of a dilation includes the **scale factor** (or **ratio**) and the **center of the dilation**. The center of dilation is a fixed point in the plane about which all points are expanded or contracted.

If the scale factor is greater than 1, the image is an enlargement (a stretch).

If the scale factor is between 0 and 1, the image is a reduction (a shrink).

Dilations create similar figures, but are not an isometry! Why?

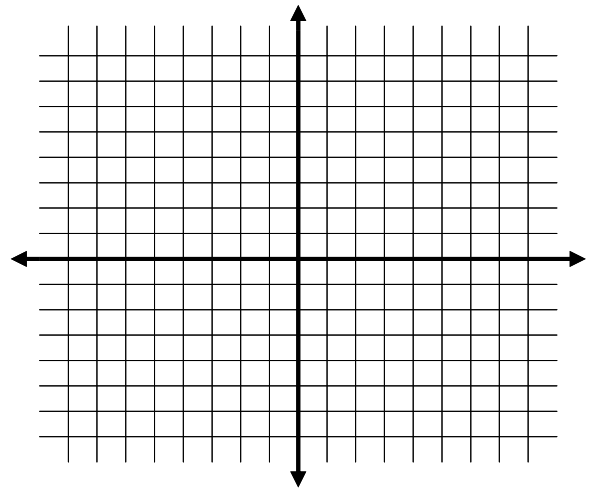
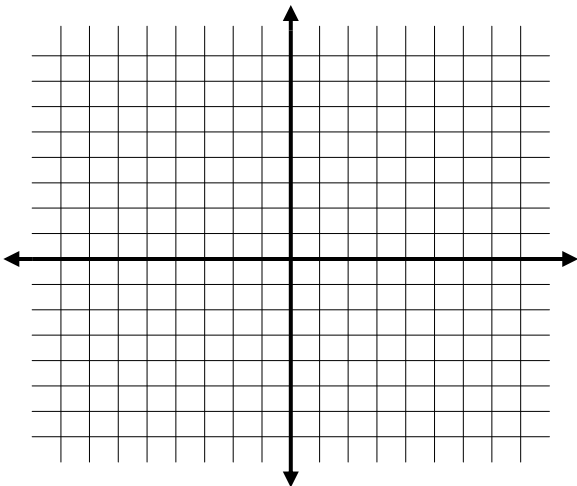
Instructions: To calculate a dilation, you multiply the coordinates of the preimage by the scale factor.

A (2, 1) B (4, 1) C(2, 4); scale factor = 2

A (2, 2) B (-6,2) C(-6,-4) D(2, -4); scale = $\frac{1}{2}$

A' (,) B' (,) C'(,)

A' (,) B' (,) C'(,) D' (,)

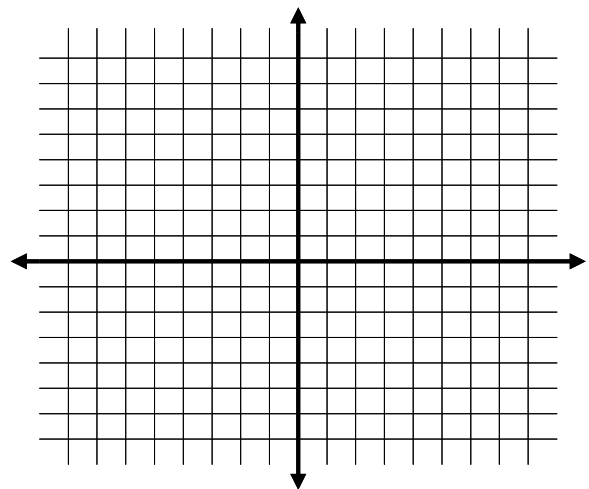
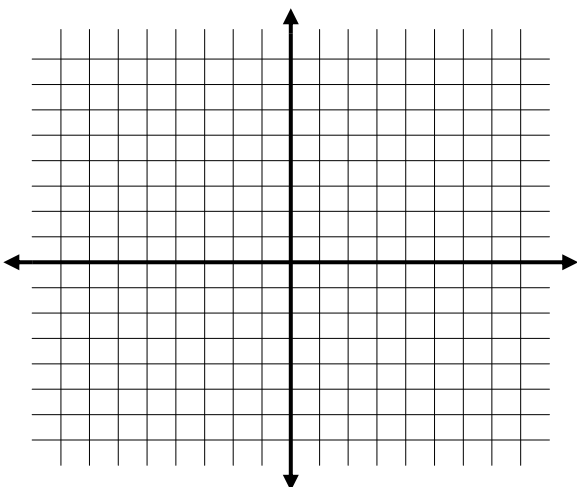


A (1, -2) B (0, 0) C(-1, -2); scale factor = 3

A (0, 3) B (-3,9) C(-6,3) D(-3, -6); scale = $\frac{1}{2}$

A' (,) B' (,) C'(,)

A' (,) B' (,) C'(,) D' (,)



Find the coordinates of the image after the dilation.

10. $A = (5, -1)$ $SF = 2$

$A' =$ _____

11. $B = (12, 9)$ $SF = \frac{1}{3}$

$B' =$ _____

12. $C = (-1, -3)$ $SF = 4$

$C' =$ _____

13. $D = (-16, 8)$ $SF = \frac{3}{4}$

$D' =$ _____

14. $E = (2, -12)$ $SF = \frac{1}{2}$

$E' =$ _____

15. $F = (0, -1)$ $SF = 9$

$F' =$ _____

16. $G = (6, 3)$ $SF = \frac{2}{3}$

$G' =$ _____

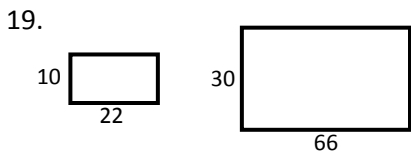
17. $H = (-27, -18)$ $SF = \frac{4}{9}$

$H' =$ _____

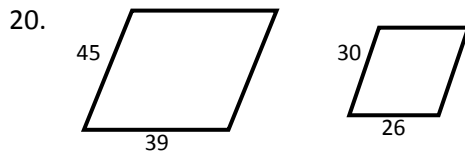
18. $I = (-2, -3)$ $SF = 6$

$I' =$ _____

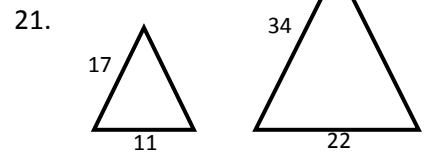
Find the scale factor of each dilation. The left-hand figure is the preimage, the right-hand figure is the image.



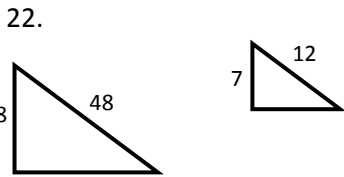
SF = _____



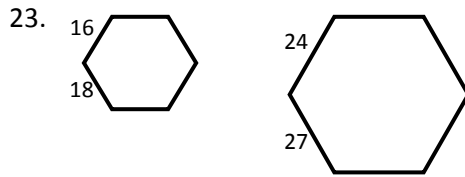
SF = _____



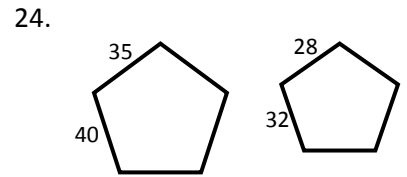
SF = _____



SF = _____



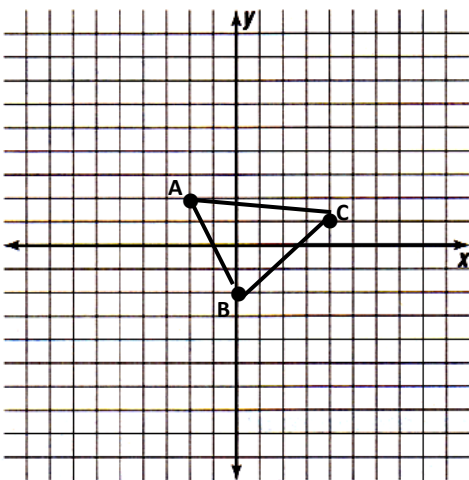
SF = _____



SF = _____

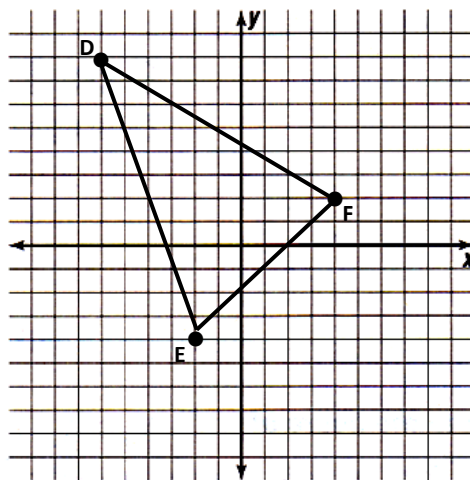
Sketch the image and find the coordinates for each dilation with the given scale factor.

25. scale factor = 2



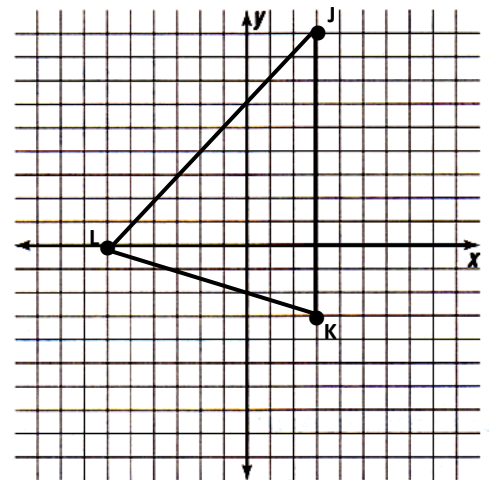
$A' =$ _____ $B' =$ _____ $C' =$ _____

26. scale factor = $\frac{1}{2}$



$D' =$ _____ $E' =$ _____ $F' =$ _____

27. scale factor = $\frac{2}{3}$



$J' =$ _____ $K' =$ _____ $L' =$ _____