Unit 9.5 Dilations PRACTICE
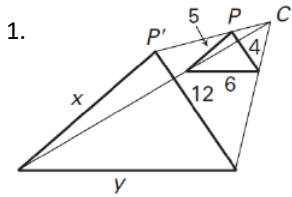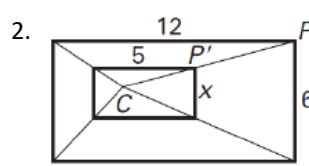
Find the scale factor. Tell whether the dilation is a reduction or an enlargement. Then find the value of the variables.

1.

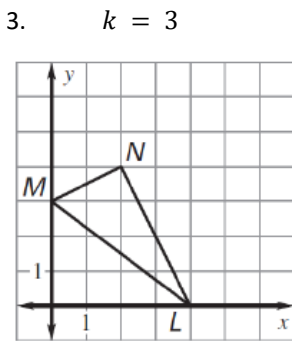Scale factor: k = 3

Type of dilation: enlargement

x =   15   y =   18
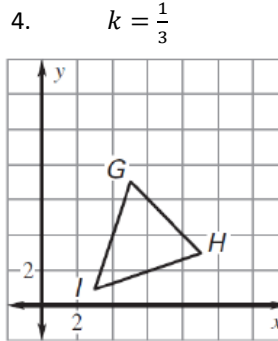
2.

Scale factor: $\frac{5}{12}$
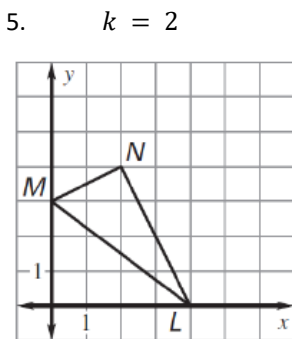
Type of dilation: reduction

x =   2.5

Use the origin as the center of the dilation and the given scale factor to find the coordinates of the vertices of the image of the polygon.
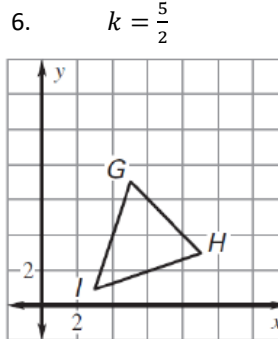
3. $k = 3$

L′(12, 0)

M′(0, 9)

N′(6, 12)

4. $k = \frac{1}{3}$

G′$(\frac{5}{3}, \frac{7}{3})$

H′(3, 1)

I′$(1, \frac{1}{3})$

5. $k = 2$

L′(8, 0)

M′(0, 6)

N′(4, 8)

6. $k = \frac{5}{2}$

G′$(\frac{25}{2}, \frac{35}{2})$

H′$(\frac{45}{2}, \frac{15}{2})$

I′$(\frac{15}{2}, \frac{5}{2})$

A dilation maps A to A′ and B to B′. Find the scale factor of the dilation. Find the center of the dilation.

7. $A(4, 2), A′(5, 1), B(10, 6), B′(8, 3)$ Scale factor: $k = \frac{1}{2}$ Center of dilation: $(6, 0)$

8. $A(1, 6), A′(3, 2), B(2, 12), B′(6, 20)$ Scale factor: $k = 3$ Center of dilation: $(0, 8)$

9. $A(3, 6), A′(6, 3), B(11, 10), B′(8, 4)$ Scale factor: $k = \frac{1}{4}$ Center of dilation: $(7, 2)$

10. $A(-4, 1), A′(-5, 3), B(-1, 0), B′(1, 1)$ Scale factor: $k = 2$ Center of dilation: $(-3, -1)$

The vertices of parallelogram ABCD are $A(1,1)$, $B(3,5)$, $C(11,5)$, and $D(9,1)$.
Graph the image of the parallelogram after a composition of the transformations in the order they are listed.

11. Translation: $(x,y) \longrightarrow (x+5, y-2)$
then Dilation: centered at the origin with a scale factor of $\frac{3}{5}$

A'' $(3.6, -0.6)$

B''$(4.8, 1.8)$

C''$(9.6, 1.8)$

D''$(8.4, -0.6)$

12. Dilation: centered at the origin with a scale factor of 2
then Reflection: in the x-axis

A'' $(2, -2)$

B''$(6, -10)$

C''$(22, -10)$

D''$(18, -2)$

You are projecting images onto a wall with a flashlight. The lamp of the flashlight is 8.3 centimeters away from the wall. The preimage is imprinted onto a clear cap that fits over the end of the flashlight. This cap has a diameter of 3 centimeters. The preimage has a height of 2 centimeters and the lamp of the flashlight is located 2.7 centimeters from the preimage.

13.   Sketch a diagram of the dilation.   Sketch:
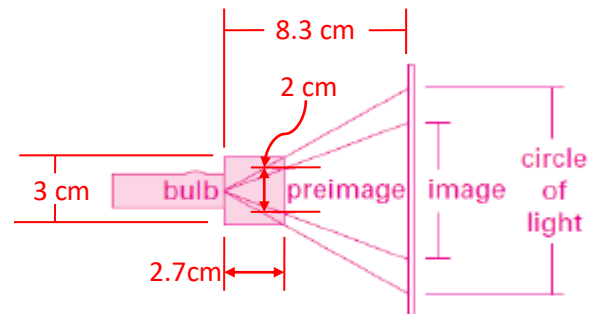
14.   Find the diameter of the circle of light
        Projected onto the wall from the flashlight.

Diameter of circle of light: about 9.22 cm

15.   Find the height of the image
        Projected onto the wall.
        Height of projected image: about 6.15 cm