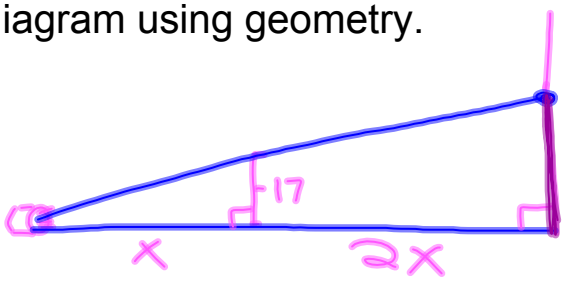
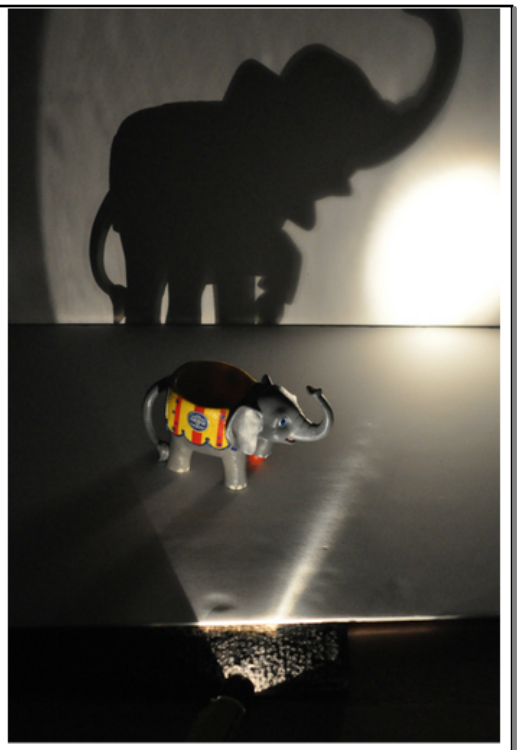
Geometry

Chapter 9

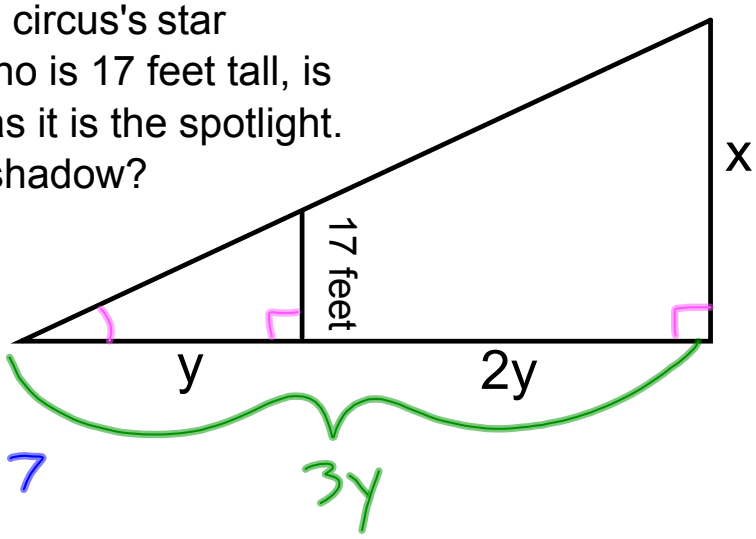
Section 9-6

A floodlight is shone on the circus's star elephant. The elephant, who is 17 feet tall, is twice as far from the wall as it is from the spotlight. Draw a label a diagram using geometry.





A spotlight is shone on the circus's star elephant. The elephant, who is 17 feet tall, is twice as far from the wall as it is the spotlight. How tall is the elephant's shadow?



Similar △s

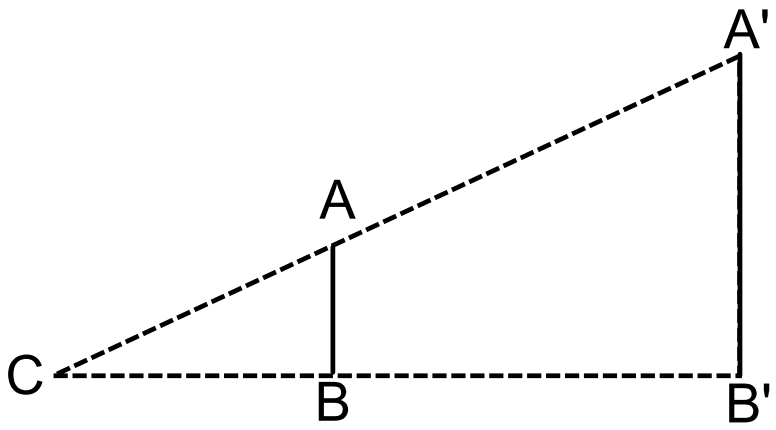
AA~

$17 \cdot \frac{3y}{y} = \frac{x}{17} \cdot 17$

$51 = x$

$\overline{A'B'}$ is an enlargement of $\overline{AB}$.

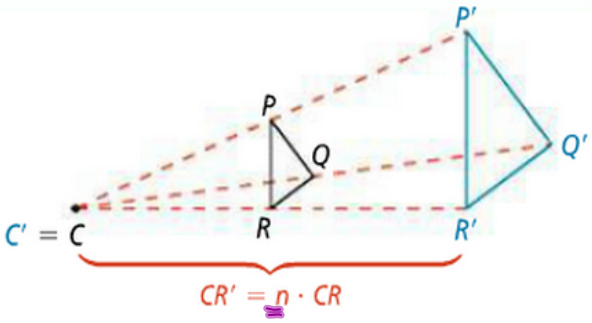
The enlargement is based on point C.



Key Concept Dilation

A **dilation** with **center of dilation** C and **scale factor** n, $n > 0$, can be written as $D_{(n, C)}$.

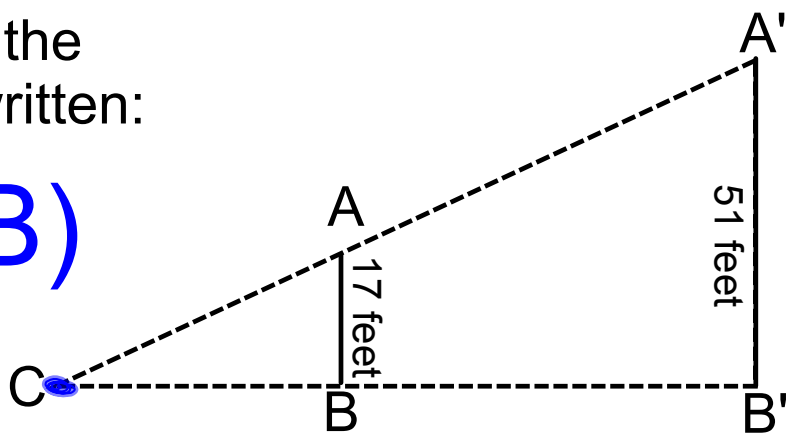
- The image of C is itself (that is, $C' = C$).
- For any other point R, R' is on $\overrightarrow{CR}$ and $CR' = n \cdot CR$, or $n = \frac{CR'}{CR}$.
- Dilations preserve angle measure.



A dilation is an **enlargement** if the scale factor n is greater than 1. The dilation is a **reduction** if the scale factor n is between 0 and 1.

The Dilation for the diagram can be written:

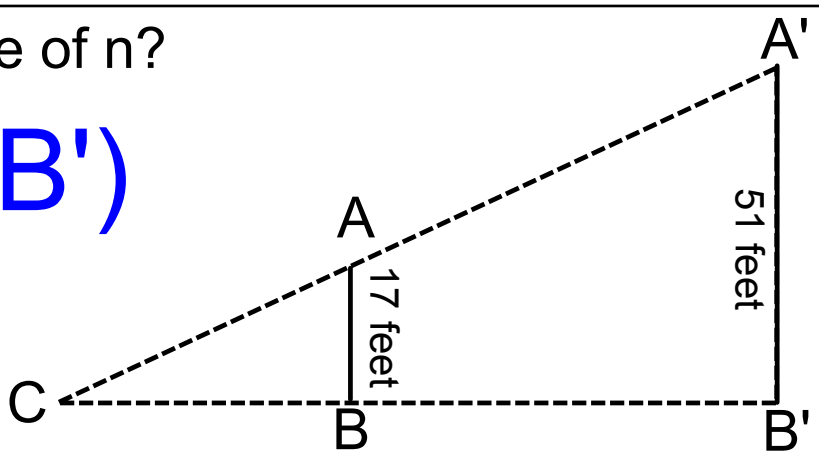
$D_{(3,C)}(AB)$



What is the value of n?

$D_{(n,C)}(A'B')$

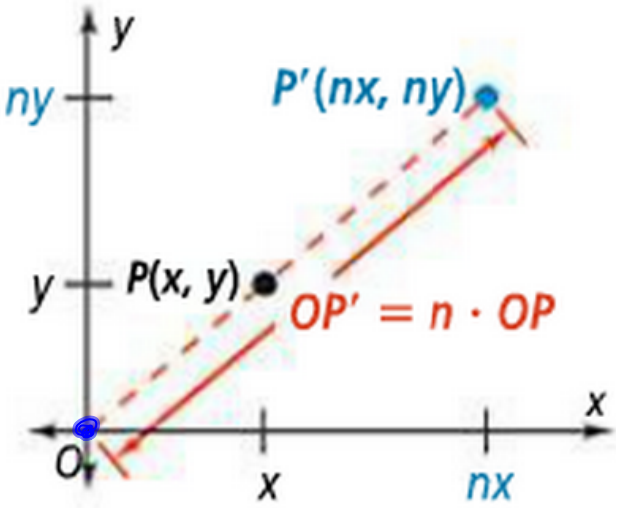
$n = \frac{1}{3}$



In the coordinate plane, dilations are assumed to be centered at (0, 0) so can be written:

$D_n(x,y) = (nx, ny)$

**n is the scale factor



Find the value of k and m.

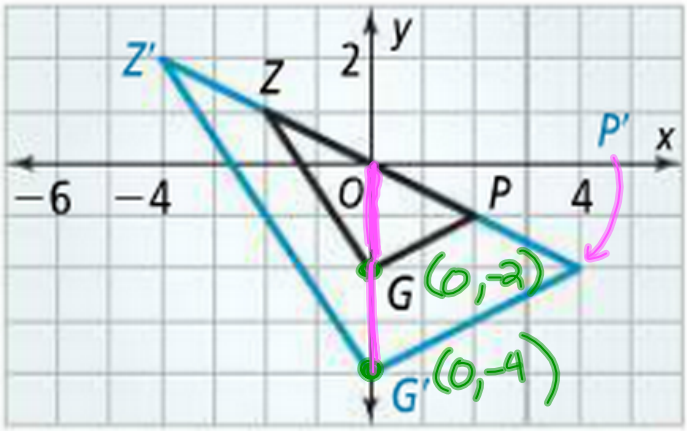
$D_n(x,y)=(nx,ny)$

$D_k(ZPG)=Z'P'G'$

$k=2$

$D_m(Z'P'G')=ZPG$

$m=\frac{1}{2}$



Give the coordinates of the image for each dilation.

$D_9(6, -2) = (9\cdot 6, 9\cdot -2) = (54, -18)$

$= (\frac{1}{2}\cdot 7, \frac{1}{2}\cdot 20) = (3.5, 10)$

You are looking at the wing of a honeybee under a microscope with a magnification of 20x. You measure the length of the magnified image of the wing as 18.2 cm. What is the actual length of the wing?

image = n(pre)

18.2 = 20(pre)

$\frac{18.2}{20} = .91 cm$

Homework

Pages 590 - 593

7 - 33 odd, 49 - 55 all