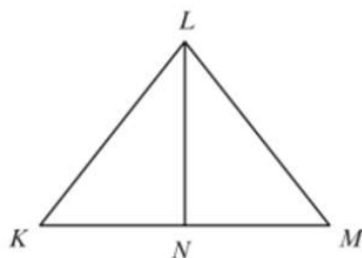



50. In this figure, $\overline{LN} \perp \overline{KM}$.



What information would a student need to prove $\triangle KLN \sim \triangle MLN$?

- A $\angle LKN \cong \angle LMN$
- B $\angle LNK \cong \angle LNM$
- C $\angle KLN \cong \angle LNM$
- D $\angle LKN \cong \angle NLM$



What is the scale factor of an image $A'(-3, 12)$ from a pre-image $A(-.5, 2)$?

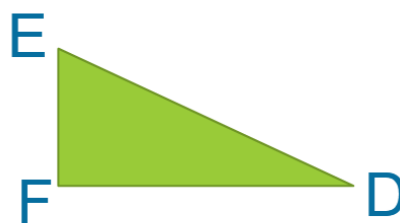
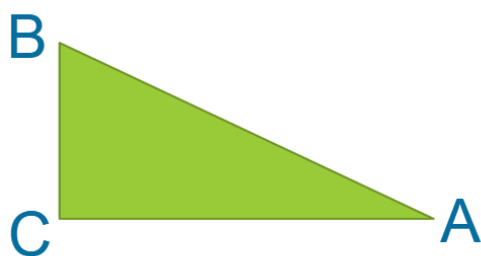
Similar Polygons

Similar Polygons

1. Corresponding angles
are Congruent

2. Corresponding sides
are proportional

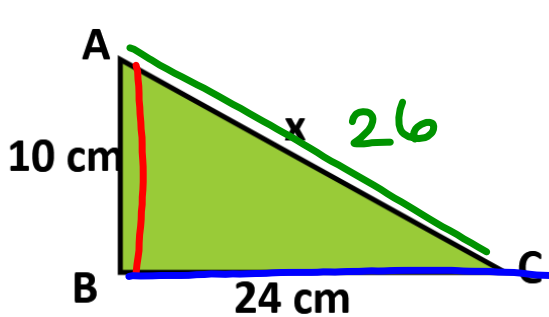
Similarity Statement



$\triangle ABC \sim \triangle DEF$

Solve for x and y.

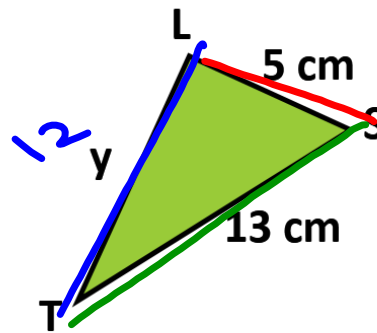
$$\triangle ABC \sim \triangle SLT$$



$$\frac{\text{BIG } x}{24} = \frac{\text{small } 13}{12}$$

$$12x = 312$$

$$x = 26$$



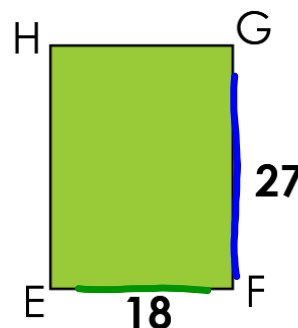
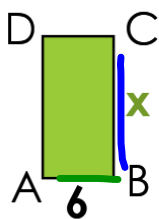
$$\frac{10}{5} = 2 \quad \frac{24}{y} = 2$$

$$\frac{\text{Small } 10}{5} = \frac{\text{BIG } 24}{y}$$

$$\frac{10y}{10} = \frac{120}{10}$$

$$y = 12$$

$ABCD \sim EFGH$. Solve for x .

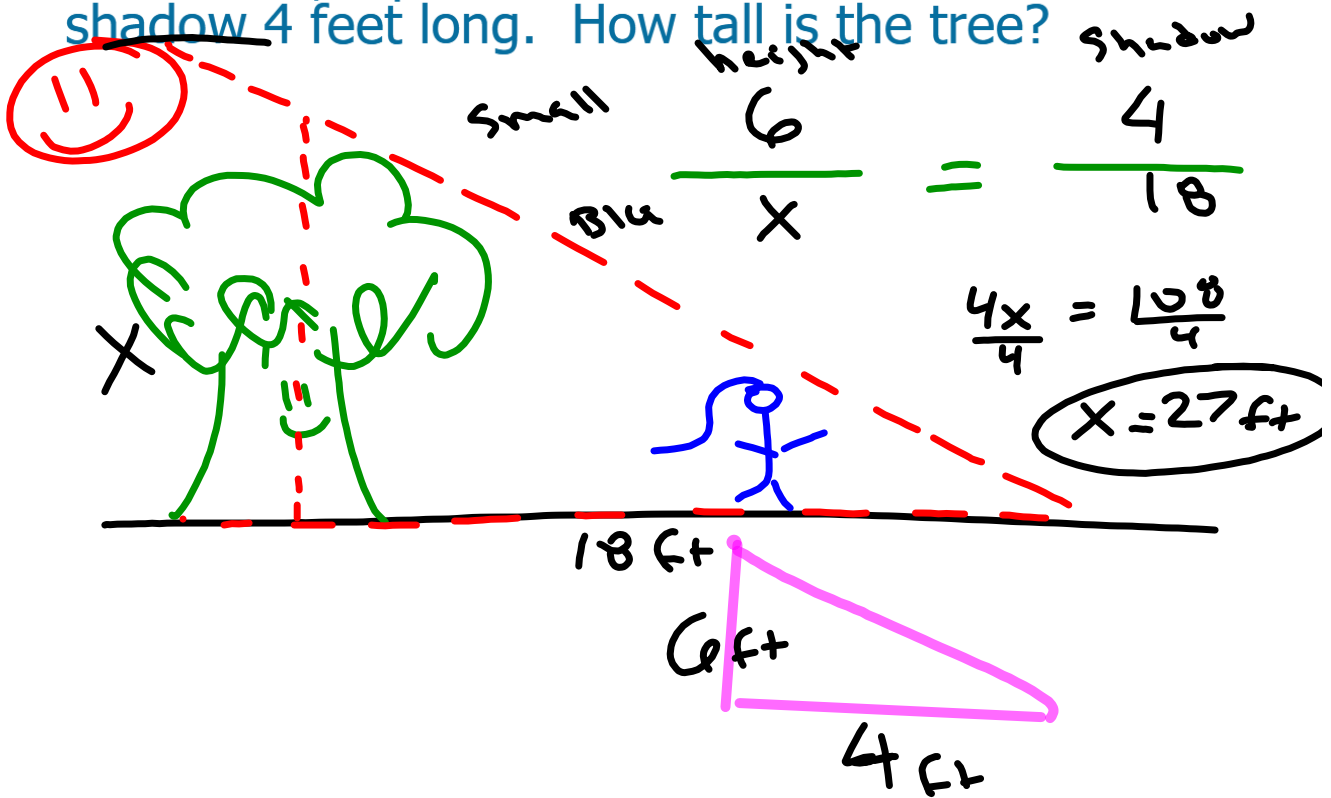


$$\frac{\text{Big } 18}{\text{Small } 6} = \frac{27}{x}$$

$$\frac{18x}{18} = \frac{162}{18}$$

$$x = 9$$

Ex. A tree casts a shadow 18 feet long. At the same time, a person who is 6 feet tall casts a shadow 4 feet long. How tall is the tree?



Perimeter 1:3

Ratio of Similar Polygons

Corresponding Sides : Corresponding Sides

same as

$$\frac{30}{90} = \frac{1}{3}$$

Perimeter : Perimeter

A : B

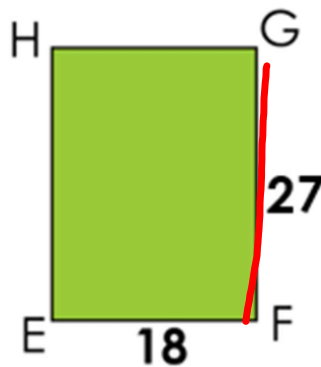
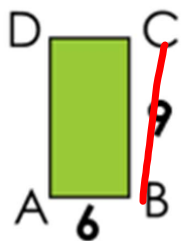
Small : Big

30 : 90

1 : 3

9 : 27

1 : 3



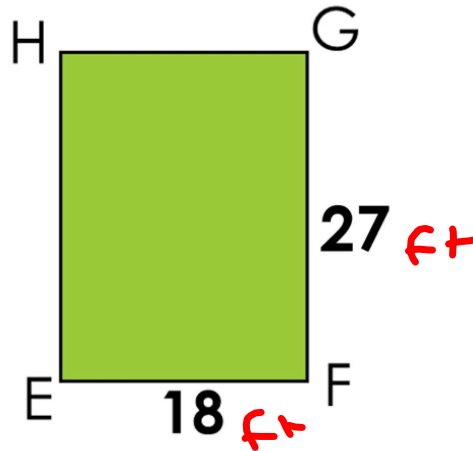
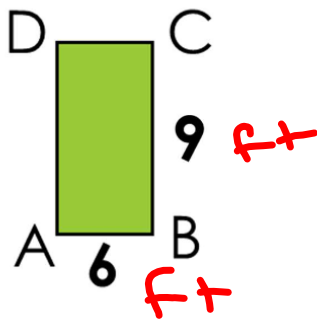
Ratio of Similar Polygons

Perimeter 1:3
Area 1:9

Area : Area

$$A^2 : B^2$$

$$54 \text{ ft}^2 : 486 \text{ ft}^2$$
$$1 : 9$$



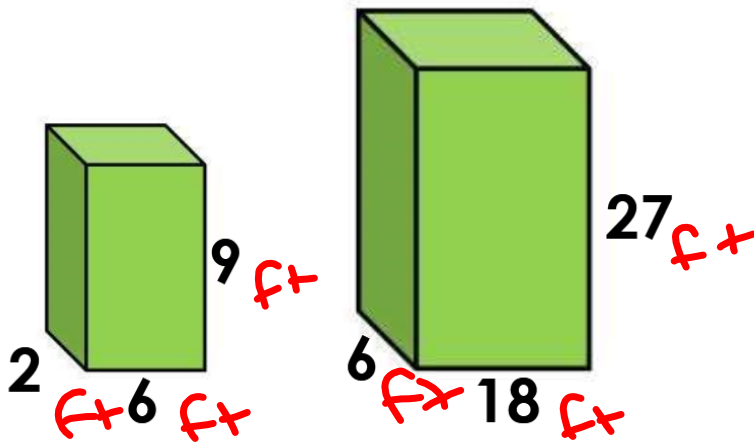
Square
the Perimeter
ratio

Ratio of Similar Figures
Volume : Volume

Perimeter 1:3
 Area 1:9
 Volume 1:27

$A^3 : B^3$

Small : Big
 108 ft³ : 2916 ft³

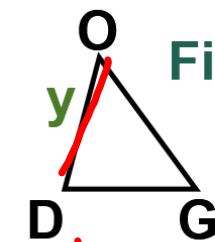
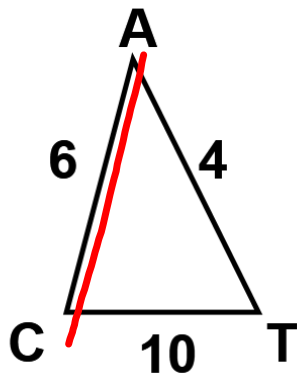


1:27
 Cube the perimeter ratio.

The ratio of the perimeters of two similar polygons equals the ratio of any pair of corresponding sides

$$y = 6 \left(\frac{2}{3} \right) = 4$$

The ratio of the perimeters of CAT to DOG is 3:2



Find the value of y.

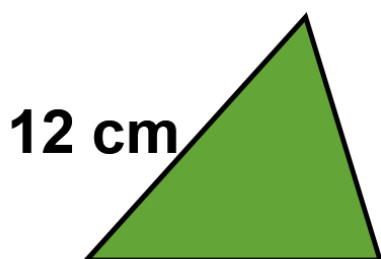
3/6

$$\frac{6}{y} = \frac{3}{2}$$

sum

$$\frac{3y}{3} = \frac{12}{3} \quad y = 4$$

Find the perimeter of the smaller triangle.



Perimeter = 60 cm



Perimeter = x

$$x = 20$$

Big

$$\frac{12}{4} = \frac{60}{x}$$

Small

$$\frac{12x}{12} = \frac{240}{12}$$

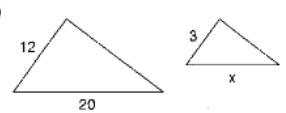
Kuta Software - Infinite Pre-Algebra

Name _____

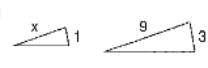
Similar Figures

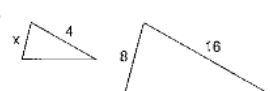
Date _____ Period _____

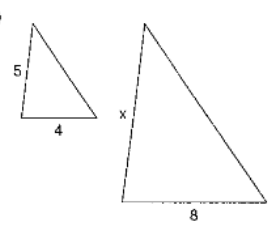
Each pair of figures is similar. Find the missing side.

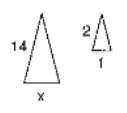
1)  $x = 5$

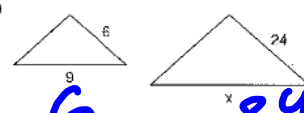
$$\frac{20}{12} = \frac{x}{3} = \frac{12}{12}$$

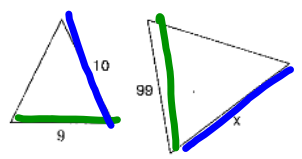
2)  $\frac{3}{1} = \frac{9}{x}$
 $\frac{3x}{3} = \frac{9}{3}$
 $x = 3$

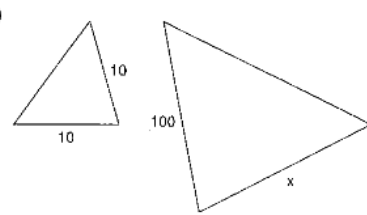
3)  $\frac{8}{x} = \frac{16}{4}$ $x = 2$
 $32 = 16x$

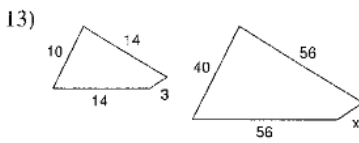
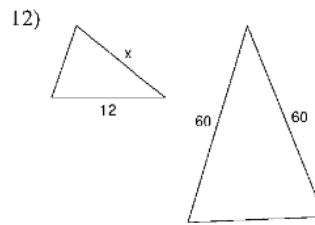
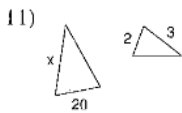
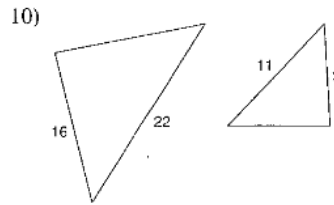
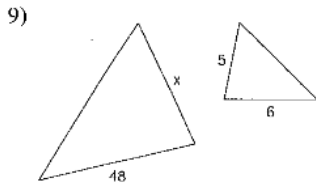
4)  $\frac{x}{5} = \frac{8}{4}$
 $4x = 40$
 $x = 10$

5)  $\frac{14}{x} = \frac{2}{1}$
 $x = 7$ $\frac{14}{2} = 7$
 $\frac{x}{1} = 7$

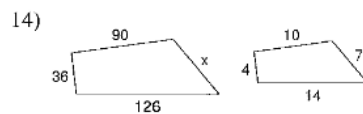
6)  $\frac{6}{9} = \frac{24}{x}$
 $9x = 216$
 $x = 36$

7)  $x = 110$

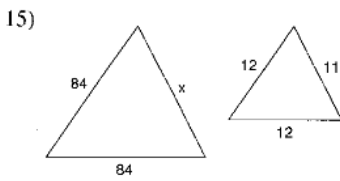
8)  $x = 100$



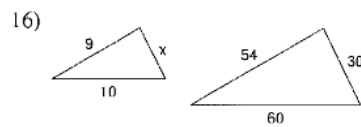
$x = 12$



$x = 63$



$x = 77$



$x = 5$

Geometry

Similarity and Dilations

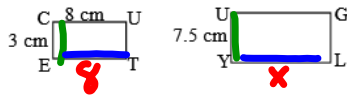
Name: _____ Date: _____

SIMILARITY OF TRIANGLES & RECTANGLES

Dilations as Proportions

on a rectangle, 

Ex) Rectangle CUTE was dilated to create rectangle UGLY. Find the length of LY.

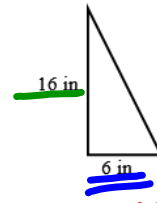


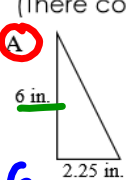
Small $\frac{3}{7.5} = \frac{8}{x}$
 Big $3x = 60$

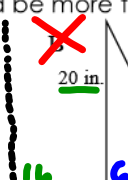
$x = 20 \text{ cm}$

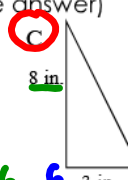
Ex) Determine which of the following figures could be a dilation of the triangle to the right.

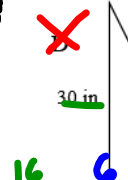
(There could be more than one answer)



A  $\frac{16}{6} = \frac{6}{2.25} = 2.25$
 $2.67 = 2.67 \checkmark$

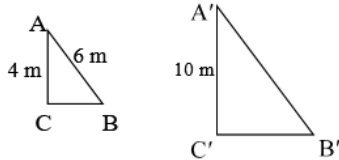
B  $\frac{16}{20} = \frac{6}{10} = .8$
 $.8 \neq .6$

C  $\frac{16}{8} = \frac{6}{3} = 2$
 $2 = 2 \checkmark$

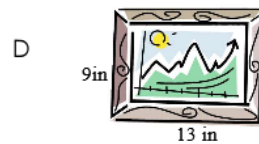
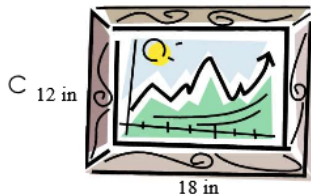
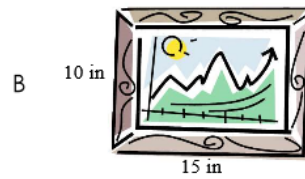
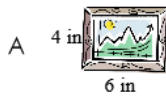
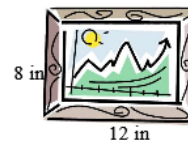
D  $\frac{16}{30} = \frac{6}{5} = 1.2$
 $.53 \neq 1.2$

Sides are proportional
 → same scale factor

1. Find the length of $\overline{A'B'}$ after the dilation.



2. Which of the following could **NOT** be an enlargement or reduction (dilation) of the original painting shown at right?

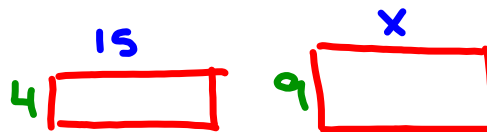


Geometry

Similarity and Dilations

Word Problems:

Write the equation for each and solve. Show all work.



1. Two rectangles are similar. The first is 4 in. wide and 15 in. long. The second is 9 in. wide.

a) Find the length of the second rectangle.

$$\frac{4}{9} = \frac{15}{x}$$

$$4x = 135$$

$$x = 33.75 \text{ in}$$

33.75 in. long

b) How do the perimeters of the two rectangles compare? How does this compare to the scale factor?

$$P_{\text{small}} = 4 + 4 + 15 + 15 = 38$$

$$P_{\text{big}} = 9 + 9 + 33.75 + 33.75 = 85.5$$

$$\frac{85.5}{38} = 2.25$$

Scale factor was the ratio!

c) How do the areas of the two rectangles compare? How does this compare to the scale factor?

$$(2.25)^2 = (9:4)^2$$

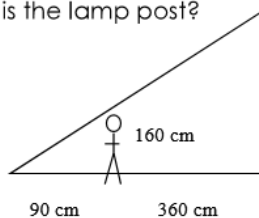
$$5.0625 = 81:16$$

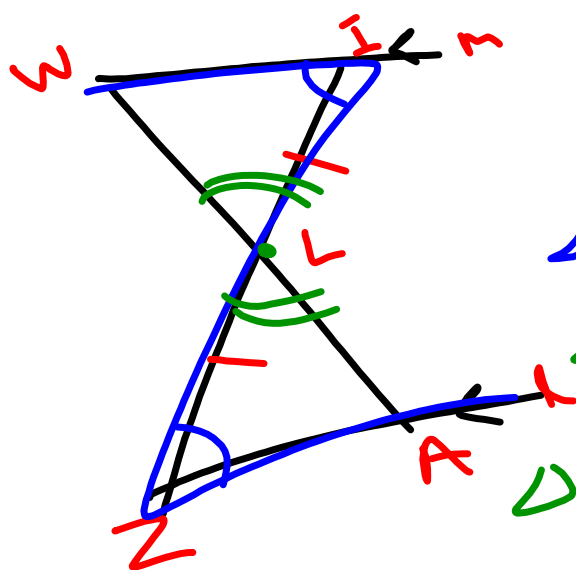
2. Two triangles are similar. The first has a base of 12 in. and a height of 8 in. The second has a base of 30 inches.

a) Find the height of the triangle.

b) How do the areas of the two triangles compare? How does this compare to the scale factor?

3) A girl 160 cm tall, stands 360 cm from a lamp post at night. Her shadow from the light is 90 cm long. How high is the lamp post?





$l \parallel m$	Given
$\overline{IL} \cong \overline{ZL}$	Given
$\angle WIL \cong \angle AZL$	Alt Ang. Thm
$\angle ILW \cong \angle ZLA$	Vert. Ang.
$\triangle WIL \cong \triangle AZL$	ASA

