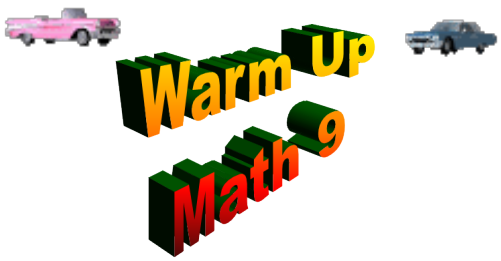
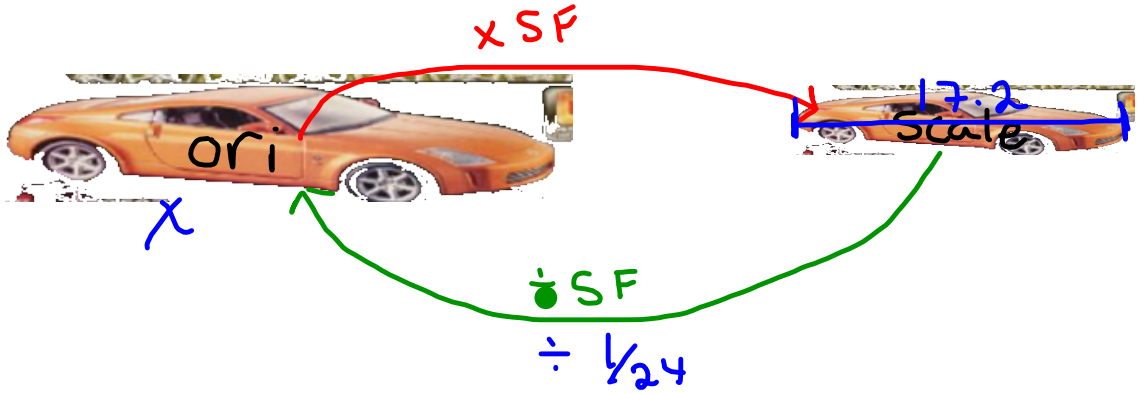


If the above model car is 17.2 cm long what was the length of the original car? 1/24



$x = 17.2 \div \frac{1}{24}$

$x = 412.8\text{cm}$

$$SF = \frac{S}{O}$$

$$\frac{1}{24} = \frac{17.2}{x}$$

$$1x = 24 \times 17.2$$

$$x = 412.8\text{cm}$$

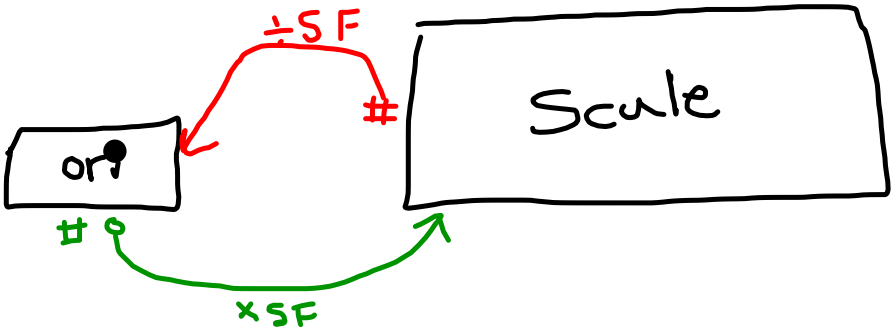
Overview

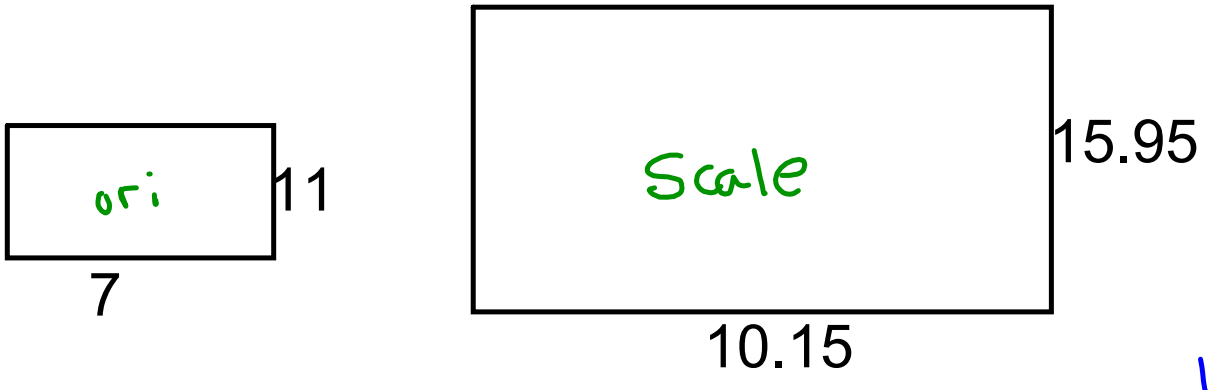
Given scale factor As a decimal

Find the scale
original x scale factor

$S = \frac{S}{O}$

Find the original
scale ÷ scale factor



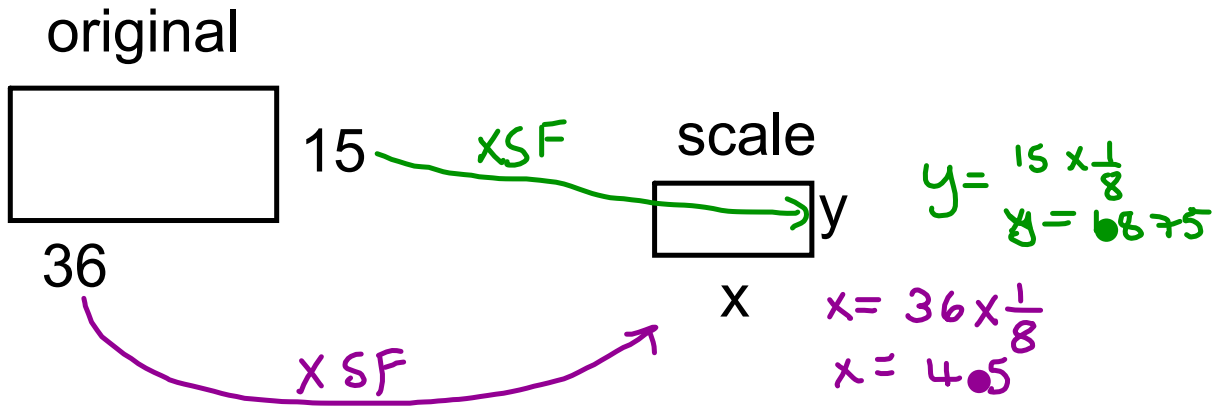


Determine the scale factor of this enlargement :

$SF = \frac{S}{O}$

$= \frac{15.95}{11}$ or $\frac{10.15}{7}$

$= 1.45$ 1.45



Determine the dimensions of the reductions if the scale factor is 1/8:

x

$SF = \frac{s}{o}$

$\frac{1}{8} = \frac{x}{36}$

$36 = 8x$

$x = \frac{36}{8}$

$x = 4.5$

y

$SF = \frac{s}{o}$

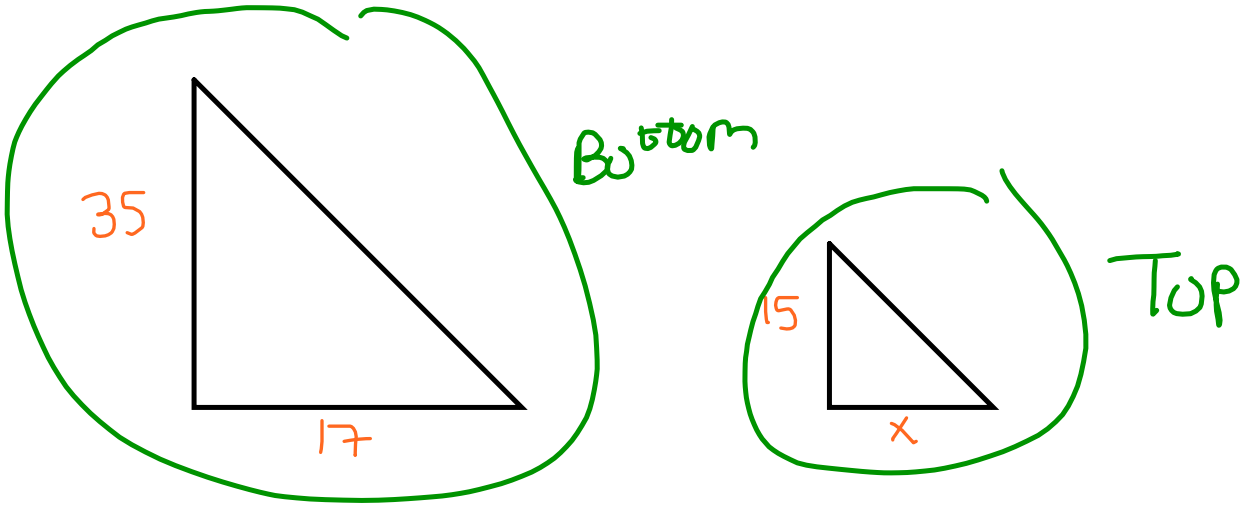
$\frac{1}{8} = \frac{y}{15}$

$8y = 15$

$y = \frac{15}{8}$

$y = 1.875$

- A tree is 35 ft tall cast a shadow that is 17 ft long. Find the length of an elephant's shadow if the elephant is 15 ft tall. (assume similar triangles)



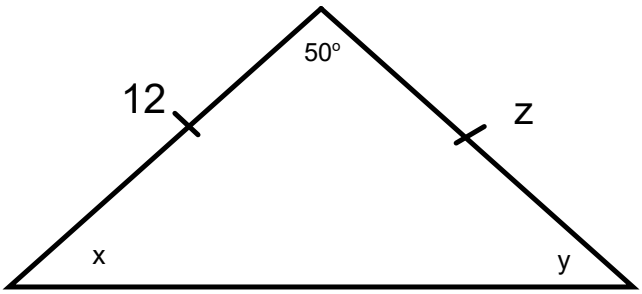
$$\frac{x}{17} = \frac{15}{35}$$

$$x = \frac{17(15)}{35}$$

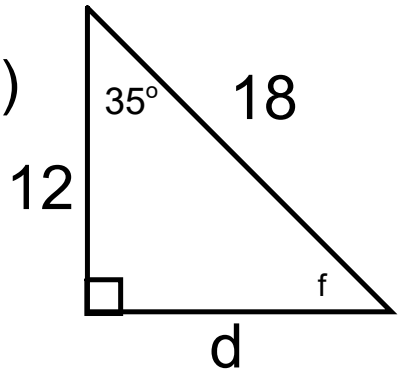
$$x = 7.3 \text{ ft}$$

Find the unknowns:

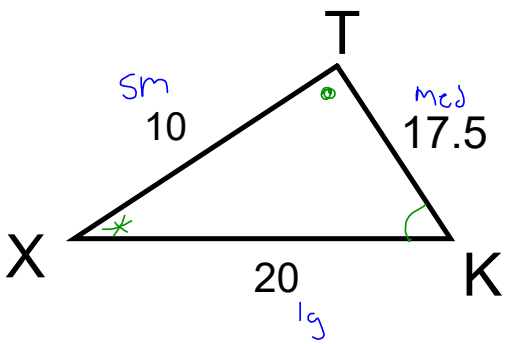
a)



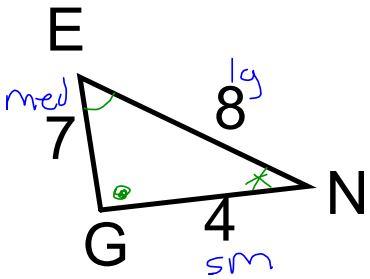
b)



Bottom



Top



sm	med	lg
$\frac{GN}{TX}$	$\frac{EG}{KT}$	$\frac{EN}{KX}$
$= \frac{4}{10}$	$\frac{7}{17.5}$	$\frac{8}{20}$
$= 0.4$	$= 0.4$	$= 0.4$

$\triangle TKX \sim \triangle GEN$ (SSS)

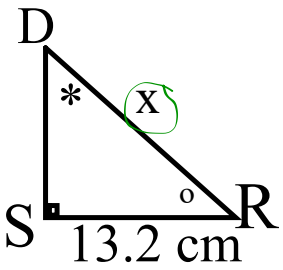
Similar Triangles

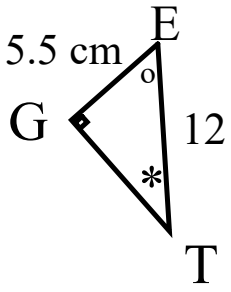
Pre-Quiz Review

i)Prove Similarity
ii) Ratios
iii) Fill in ratios
iv) solve for "x"

$\angle D = \angle T$
$\angle S = \angle G$
$\angle R = \angle E$

$\triangle DSR \sim \triangle TGE$ (AAA)



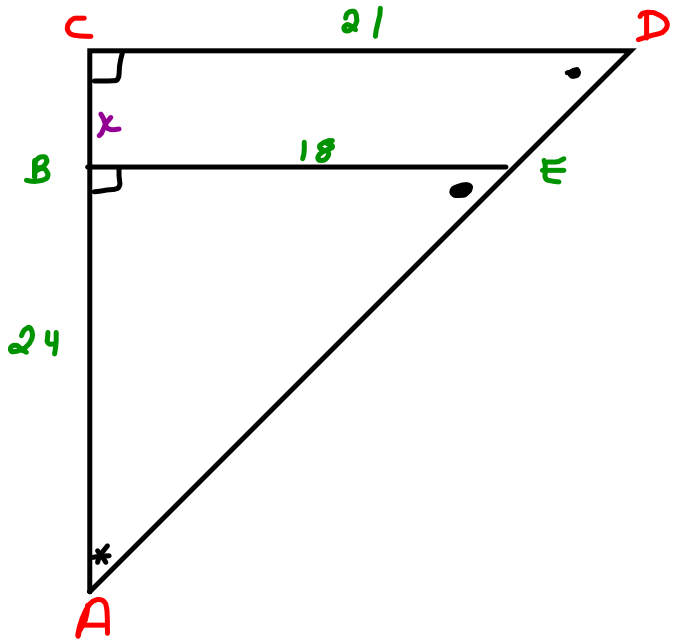


$$\frac{DR}{TE} \quad \frac{SR}{GE}$$

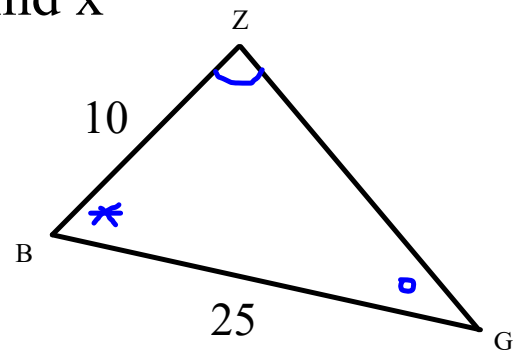
$$\frac{x}{12} = \frac{13.2}{5.5}$$

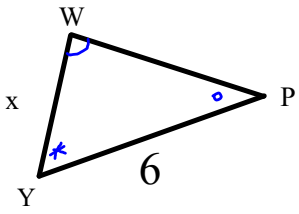
$$x = \frac{12(13.2)}{5.5}$$

$$x = 28.8 \text{ cm}$$


C
21
D
x
B
18
E
24
A

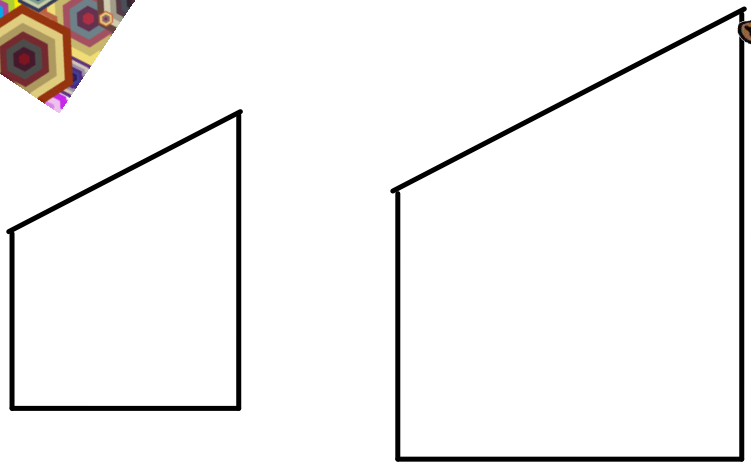
Find x





Section 7.3

Similar Polygons



Polygons are 2-dimensional shapes. They are made of straight lines, and the shape is "closed" (all the lines connect up).

Polygon
(straight sides)

Not a Polygon
(has a curve)

Not a Polygon
(open, not closed)

Similar Polygons are enlargements or reductions of each other
: Same shape, but not necessarily the same size

Corresponding: similar in position or purpose
: the same size; reduced or enlarged
- between same scaled sides

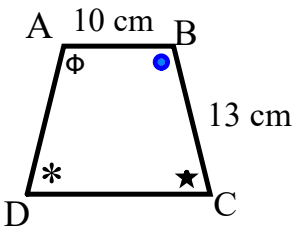
Properties of Similar Polygons
Their corresponding angles are equal
Their corresponding sides are proportional

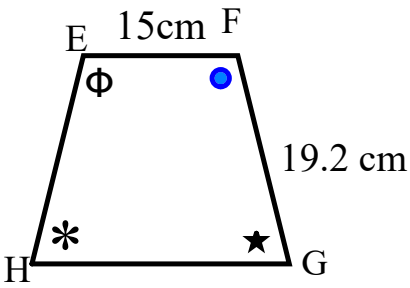
BOTH MUST BE TRUE

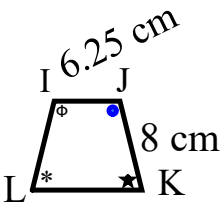
Symbol for similar is $\sim$

Identifying Similar Polygons

Which two polygons are similar?







Compare Polygon ABCD and EFGH

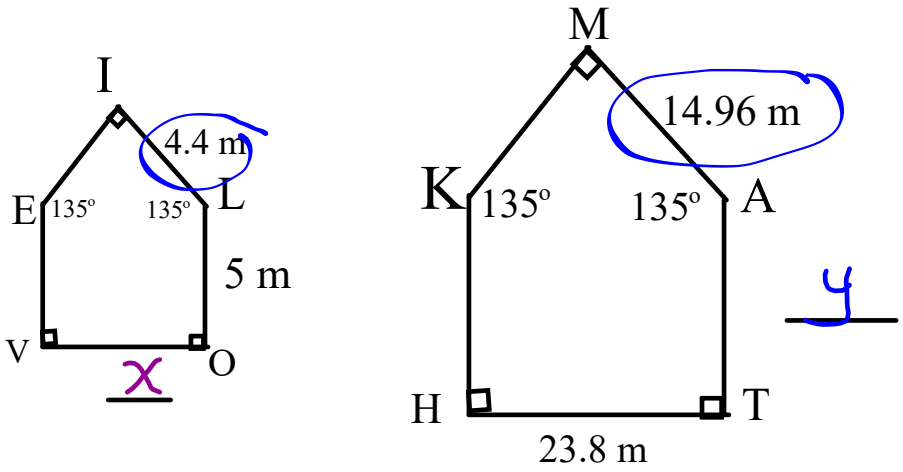
Compare Polygon EFGH and IJKL

Compare Polygon ABCD and IJKL

Solving Problems Using the Properties of Similar Polygons

These two polygons are similar.
a) Calculate the length of VO.
b) Calculate the length of AT

Use ratios



Set up 2 ratios of corresponding sides: $\frac{\text{figure 1 side}}{\text{figure 2 coressponding side}}$

Then set them equal and cross multiply

$$\frac{VO}{HT} = \frac{IL}{MA}$$

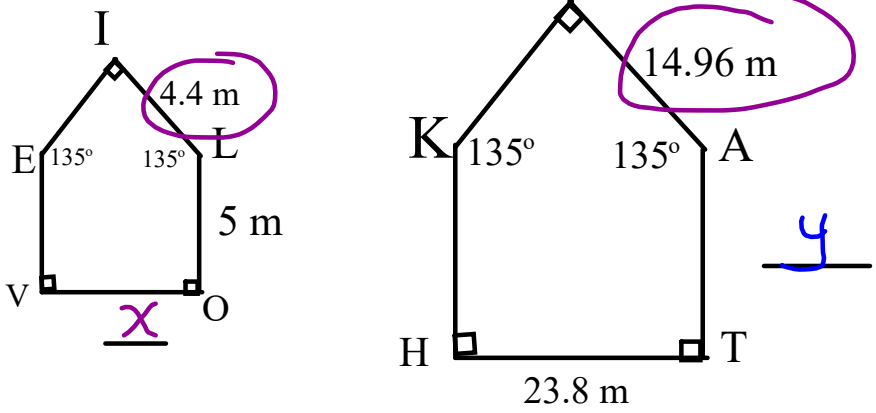
$$\frac{x}{23.8} = \frac{4.4}{14.96}$$ (23.8)

$$x = 7$$

Solving Problems Using the Properties of Similar Polygons

These two polygons are similar.
a) Calculate the length of VO.
b) Calculate the length of AT

Use ratios



Set up 2 ratios of corresponding sides: $\frac{\text{figure 1 side}}{\text{figure 2 coressponding side}}$

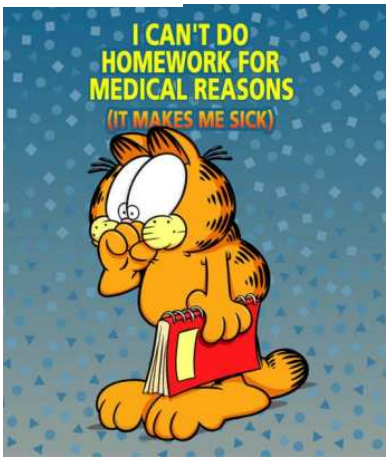
Then set them equal and cross multiply

$$\frac{AT}{LO} = \frac{MA}{IL}$$

$$\frac{y}{5}\cdot\frac{(5)}{} = \frac{14.96}{4.4}\cdot(5)$$

$$y = 17$$

Class/Homework



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Questions: 1,~~2~~,3,4,5,~~6~~ 7

Must check sides

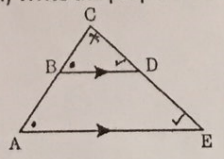
Worksheet 1,2,6,8,10

Math

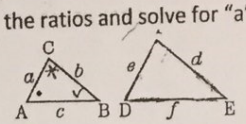
Similar Triangles

Per/Sec. _____ Date _____

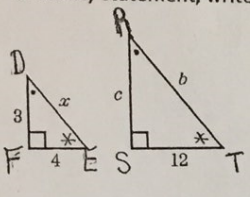
1) For the following diagram
i) Write the similarity statement
ii) Write the proper ratios



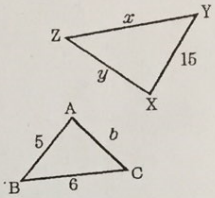
2. In the diagram shown, $\triangle ABC \sim \triangle DEF$, $c = 5$, $e = 7$, and $f = 9$. Write the similarity statement, write the ratios and solve for "a".



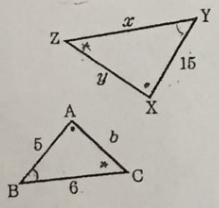
3. Given that the two triangles are similar, Write the similarity statement, write the ratios and solve for "b".



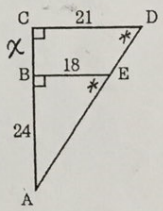
4. Given that $\triangle ABC$ is similar to $\triangle XYZ$, Write the similarity statement, write the ratios and solve for "x".



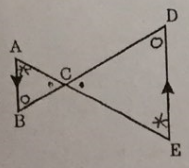
5. Given that $\triangle ABC$ is similar to $\triangle XYZ$, what is the value of ✕ ?



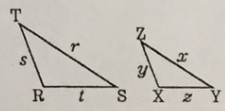
6. Write the similarity statement and ratios. Find the length of BC



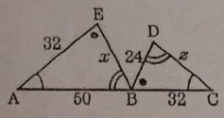
7. In the diagram, $\mathbf{AB} \parallel \mathbf{DE}$, $\mathbf{AC} = 4$, $\mathbf{BC} = 3$, and $\mathbf{DC} = 12$. Find the length of $\mathbf{EC}$.



8. In the diagram shown, $\triangle RST \sim \triangle XYZ$, $t = 2.4$, $y = 5$, and $z = 8$. Find s.



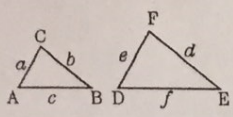
9. Find the value of x.



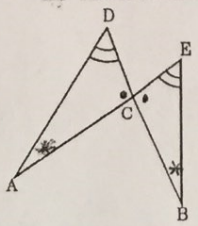
10. The sides of a triangle measures 8, 12, and 16. If the smallest side of a similar triangle measures 6, find the length of its longest side.

Show all work. (Similarity Statement, and Ratios)

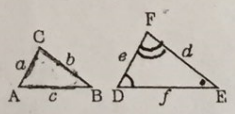
11. In the diagram shown, $\triangle ABC \sim \triangle DEF$, $a = 8$, $d = 22$, and $b = 4$. Find e.



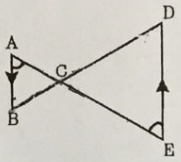
12. In the diagram, find the length of DB, given AE = 24, AC = 10 and DC = 6.



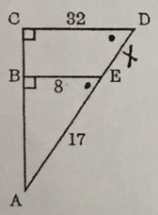
13. In the diagram shown, $\triangle ABC \sim \triangle DEF$, $a = 3$, $d = x + 2$, $b = 12$, and $e = 18$. Find x.



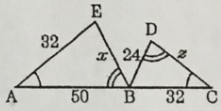
14. In the diagram, $\mathbf{AB} \parallel \mathbf{DE}$, $\mathbf{AC} = 6$, $\mathbf{AE} = 21$, and $\mathbf{BC} = 8$. Find the length of $\mathbf{BD}$.



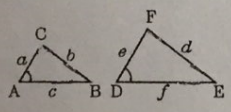
15. In the diagram, AE = 17, BE= 8, and CD = 32. Find DE.



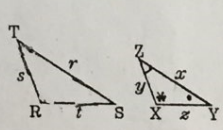
16. Find the value of z.



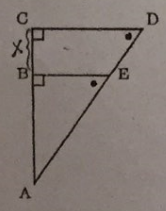
17. In the diagram shown, $\triangle ABC \sim \triangle DEF$, $a = 4$, $d = x + 4$, $b = 8$, and $e = 11$. Find x.



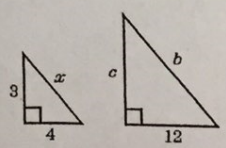
18. In the diagram shown, $\triangle RST \sim \triangle XYZ$, $s = 2$, $x = 3.91$, and $r = 2.3$. Find y.



19. In the diagram, AE = 15, BE= 9, and CD = 15. Find CB.



20. Given that the two triangles are similar, what is the value of c?



Master 7.23

Extra Practice 1

Lesson 7.1 Scale Diagrams and Enlargements

1. The actual length of a needle is 6 cm. The length of the needle on a scale diagram is 9 cm. What is the scale factor of the diagram?

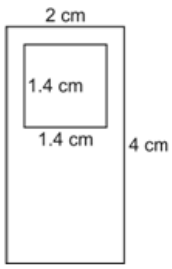
2. Scale diagrams of different circles are to be drawn. The diameter of each circle, and the scale factor are given. Determine the diameter of each circle on its scale diagram. Write the answers.

	Diameter of original circle	Scale factor	Diameter of scale diagram
a)	8 cm	6	
b)	40 mm	$\frac{15}{4}$	
c)	3.5 cm	5.8	
d)	0.6 mm	20.5	

3. Draw an enlargement of an equilateral triangle with side length 3 cm.
Use a scale factor of $\frac{5}{3}$.

3. Draw an enlargement of an equilateral triangle with side length 3 cm.
Use a scale factor of $\frac{5}{3}$.

4. Draw a scale diagram of this model of an mp3 player.
Use a scale factor of 2.5.



5. The dimensions of a photo of a mountain bike are 15 cm by 12 cm.
An enlargement is to be made for a poster with dimensions 4.0 m by 3.2 m.
What is the scale factor of the poster to the nearest tenth?

Master 7.24

Extra Practice 2

Lesson 7.2 Scale Diagrams and Reductions

1. Here is scale diagram of a picnic table.

The actual length of the picnic table is 180 cm with legs 60 cm.
What is the scale factor for this diagram?

2. A rectangular playground has dimensions 24 m by 16 m.

Draw a scale diagram of this playground with a scale factor of $\frac{1}{200}$.

3. A reduction of each object is to be drawn with the given scale factor.
Determine the corresponding length in centimetres on the scale diagram.

a) Fishing rod length 280 cm, scale factor $\frac{1}{50}$

b) Boogie board length 1.5 m, scale factor 0.05

c) Jogging route 10 km, scale factor 0.000 02

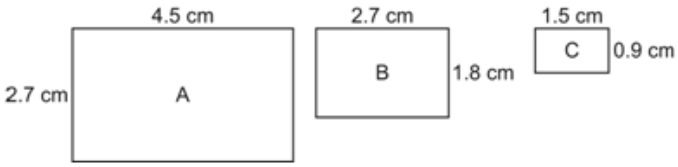
4. The scale diagram below has a scale factor of 0.25.
What are the dimensions of the actual rectangle?

Master 7.25

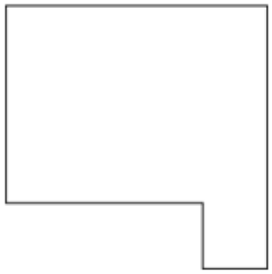
Extra Practice 3

Lesson 7.3 Similar Polygons

1. Which rectangles are similar? Give reasons for your answer.



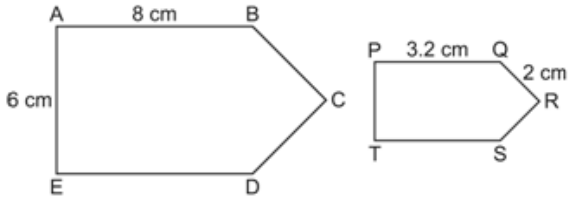
2. For the given polygon draw a similar larger polygon and a similar smaller polygon. Write the scale factor for each diagram.



3. These polygons are similar. Determine each length.

a) PT

b) BC



4. Which statements are true? Justify your answers.

a) All regular octagons are similar.

b) All quadrilaterals are similar.

c) All circles are similar.

d) All pentagons are similar.

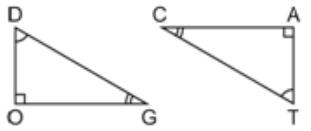
Master 7.26

Extra Practice 4

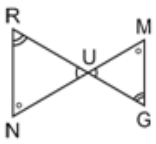
Lesson 7.4 Similar Triangles

1. Identify the similar triangles in the following diagrams.
Equal angles are marked on the diagrams.

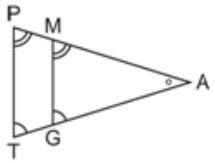
a)



b)

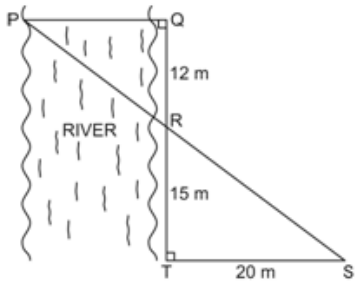


c)



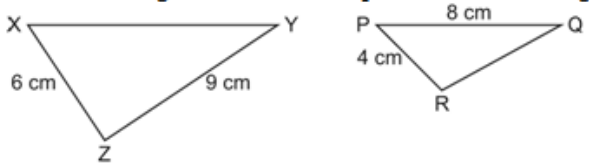
2. A person who is 1.9 m tall has a shadow that is 1.5 m long.
At the same time, a flagpole has a shadow that is 8 m long.
Determine the height of the flagpole to the nearest tenth of a metre.
Draw a diagram.

3. A surveyor wants to determine the width of a river.
She measures distances and angles on land,
and sketches this diagram.
What is the width of the river, PQ?

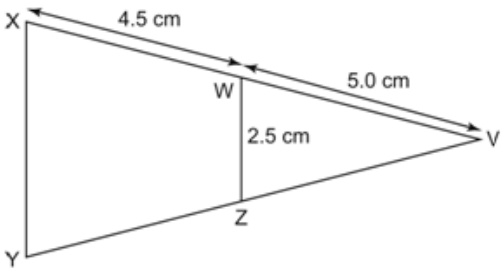


4. Determine the length of XY in each pair of similar triangles.

a)



b)



Answers:

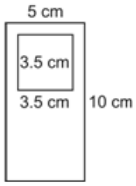
Extra Practice 1 – Master 7.23

Lesson 7.1

1. 1.5

2. **a)** 48 cm **b)** 150 mm
   c) 20.3 cm **d)** 12.3 mm

3. 

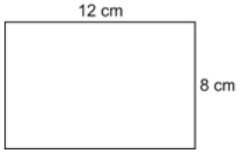
4. 

5. About 26.7

Extra Practice 2 – Master 7.24

Lesson 7.2

1. $\frac{1}{30}$

2. 

3. **a)** 5.6 cm **b)** 7.5 cm
   c) 20 cm

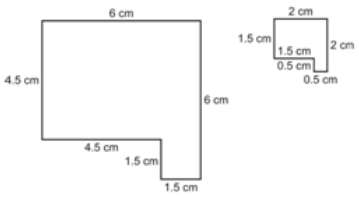
4. 32 cm by 8 cm

Extra Practice 3 – Master 7.25

Lesson 7.3

1. A and C because $\frac{4.5}{1.5} = \frac{2.7}{0.9}$

2. 1.5 0.5



3. **a)** 2.4 cm **b)** 5 cm

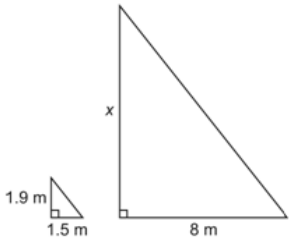
4. a and c

Extra Practice 4 – Master 7.26

Lesson 7.4

1. **a)** ΔDOG ~ ΔTAC
   b) ΔRUN ~ ΔGUM
   c) ΔPAT ~ ΔMAG

2. 10.1 m



3. 16 m

4. **a)** 12 cm **b)** 4.75 cm