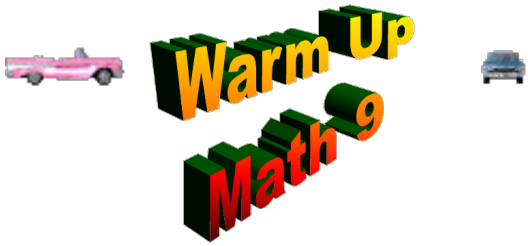


Model cars are manufactured in various scale sizes, which denotes the reduced measurement of the model cars — based on measurements taken from the actual cars. That means that our models are scaled down in size, in proportions as near exact as possible, from real cars. This in-turn allows for the realistic visual appearance of our models. The higher the ratio, the smaller the model car.

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

17.2 cm x 24 = 412.8 cm

= 4.128 m

Overview

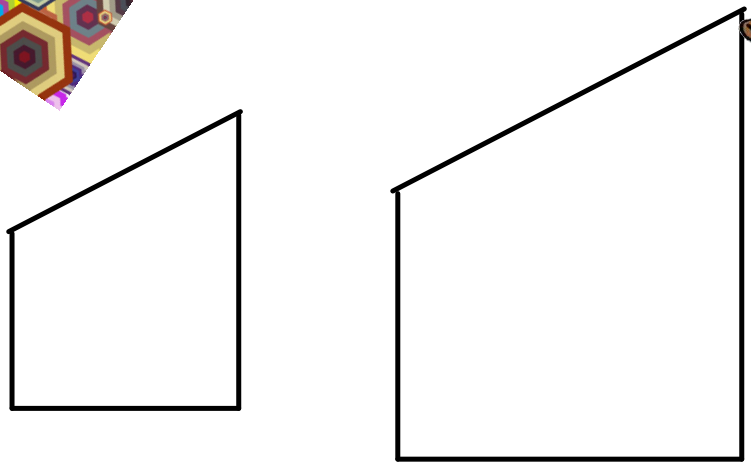
Given scale factor As a decimal

Find the scale
original x scale factor

Find the original
scale ÷ scale factor

Or yesterday's lesson

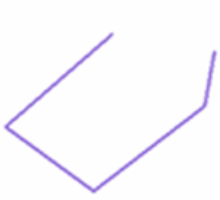
Setion 7.3
Similar Polygons



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

Polygon
(straight sides)

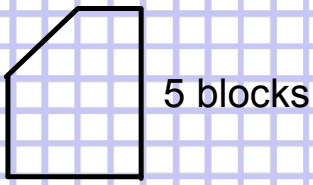
Not a Polygon
(has a curve)



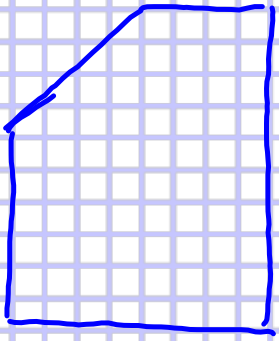
Not a Polygon
(open, not closed)

Activity

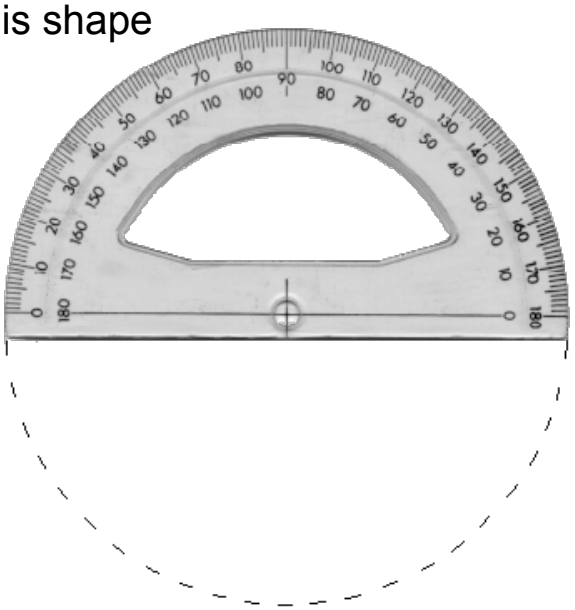
Original Shape



Doubled



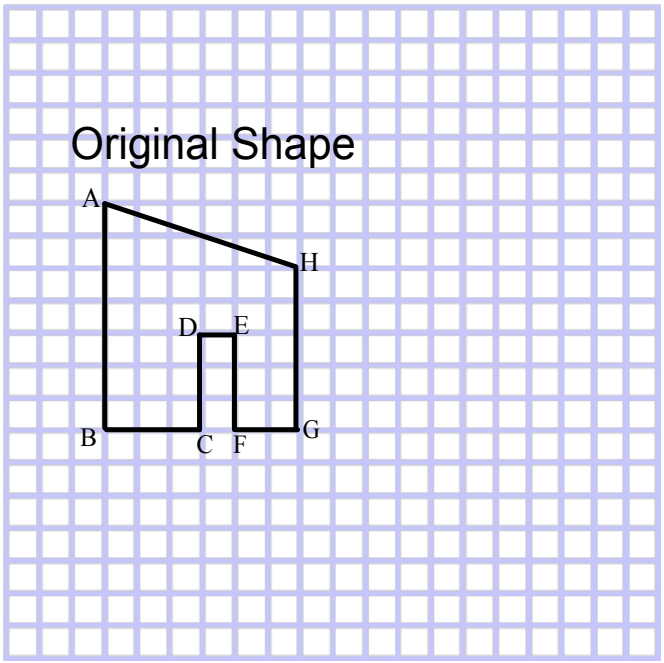
Lets double the size of this shape

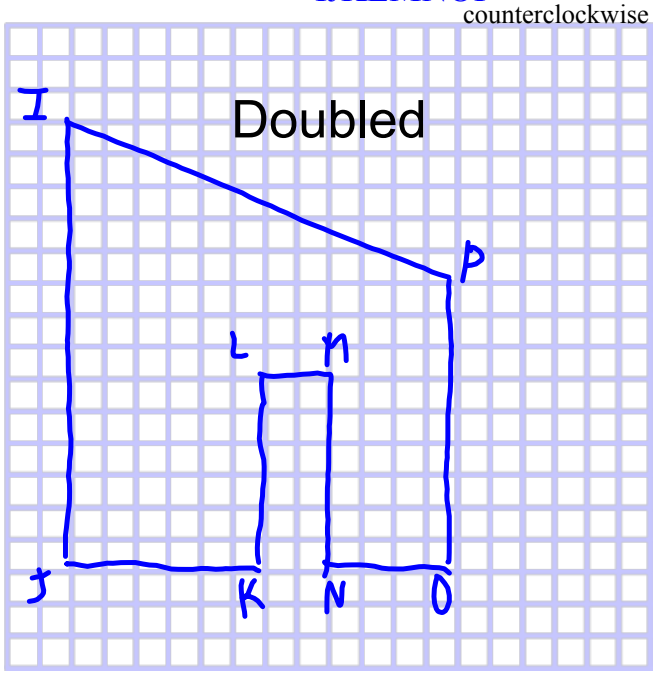


Activity

Label the first polygon
ABCDEFGH

Label your second polygon
IJKLMNOP
counterclockwise





Lets double the size of this shape

Original

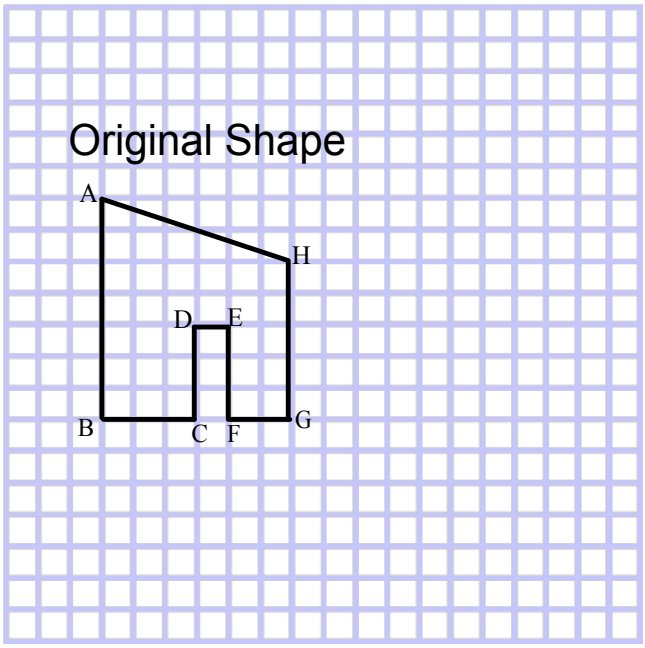
Length of sides (cm)	AB	BC	CD	DE	EF	FG	GH	HA
Measure of Angle (degrees)	<A	<B	<C	<D	<E	<F	<G	<H

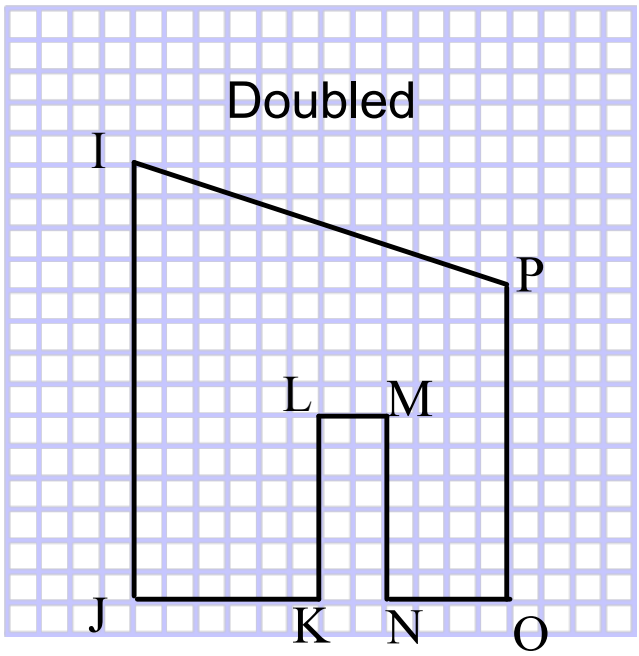
Doubled

Length of sides (cm)	IJ	JK	KL	LM	MN	NO	OP	PI
Measure of Angle (degrees)	<I	<J	<K	<L	<M	<N	<O	<P

What do you notice?

Activity

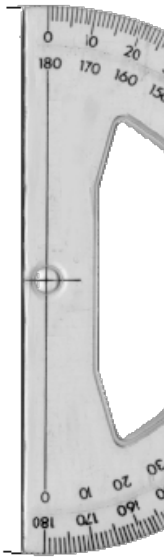




Lets double the size of this shape

Original

Length of sides (cm)	AB	BC	CD	DE	EF	FG	GH	HA
	7	3	3	1	3	2	5	
Measure of Angle (degrees)	<A	<B	<C	<D	<E	<F	<G	<H
	70°	90°	90°	270°	270°	90°	90°	110°



Doubled

Length of sides (cm)	IJ	JK	KL	LM	MN	NO	OP	PI
	14	6	6	2	6	4	10	
Measure of Angle (degrees)	<I	<J	<K	<L	<M	<N	<O	<P
	70°	90°	90°	270°	270°	90°	90°	110°

Look at side comparison

$\frac{IJ}{AB} = \frac{14}{7} = 2$ $\frac{JK}{BC} = \frac{6}{3} = 2$

and so on....

BUT THE ANGLES BETWEEN SCALED SIDES ARE THE SAME

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

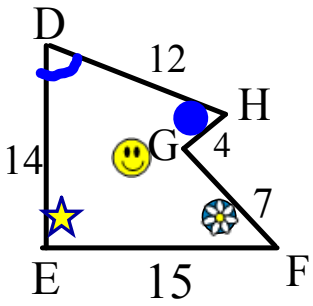
Corresponding: similar in position or purpose
: the same size; reduced or enlarged
- between same scaled sides

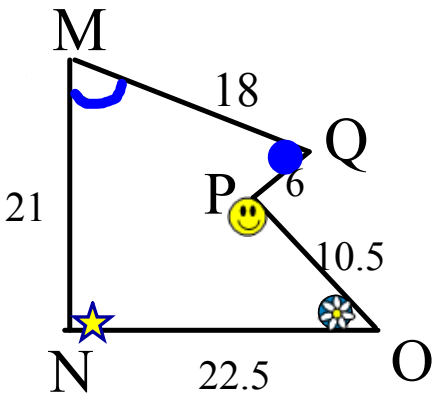
Properties of Similar Polygons
Their corresponding angles are equal Their corresponding sides are proportional

BOTH MUST BE TRUE

Symbol for similar is $\sim$

Are the following Similar Polygons?





Step1) Match up the Angles

Polygon D E F G H

Polygon M N O P Q

Step 2) Match up sides and compare their ratio

Big over Small

$$\frac{MN}{DE} = \frac{NO}{EF} = \frac{OP}{FG} = \frac{PQ}{GH} = \frac{QM}{HD}$$

But doesn't matter just ratio must be the same in order to be similar

Put in the Values

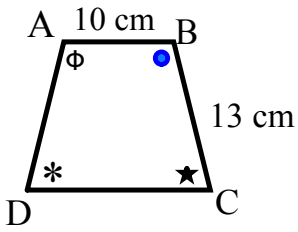
$$\frac{21}{14} = \frac{22.5}{15} = \frac{10}{7} = \frac{6}{4} = \frac{18}{12}$$

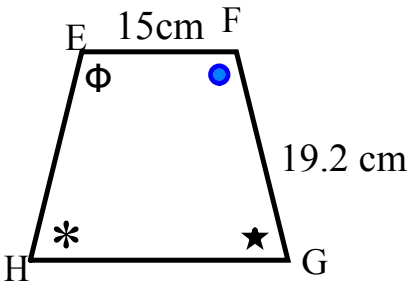
$$1.5 = 1.5 = 1.5 = 1.5 = 1.5$$

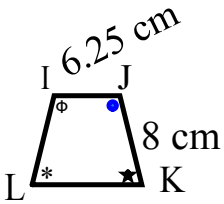
Bigger polygon is 1.5 times larger

Identifying Similar Polygons

Which two polygons are similar?







Compare Polygon ABCD and EFGH

$\frac{AB}{EF} = \frac{10}{15} = 0.6666$

$\frac{BC}{FG} = \frac{13}{19.2} = 0.677$

NOT Similar

Compare Polygon EFGH and IJKL

$\frac{EF}{IJ} = \frac{15}{6.25} = 2.4$

$\frac{FG}{JK} = \frac{19.2}{8} = 2.4$

Similar

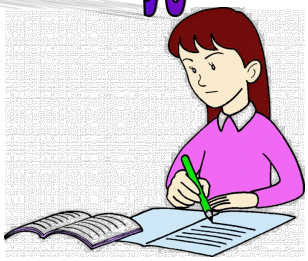
Compare Polygon ABCD and IJKL

$\frac{AB}{IJ} = \frac{10}{6.25} = 1.6$

$\frac{BC}{} = \frac{13}{8} = 1.625$

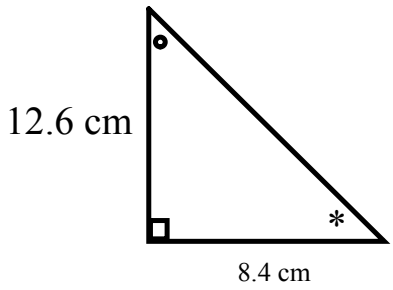
NOT Similar

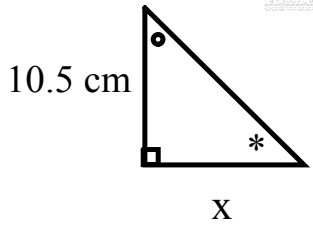
Solving Problems Using the Properties of Similar Polygons



Example 1)

Find the length of the side labled "x"





$\frac{x}{8.4} = \frac{10.5}{12.6}$ ____ = ____

$x = \frac{10.5(8.4)}{12.6}$

$= 7$ cm

$\frac{8.4}{x} = \frac{12.6}{10.5}$

$8.4(10.5) = x(12.6)$

$\frac{8.4(10.5)}{12.6} = x$

$7 = x$

____ = ____

=

=

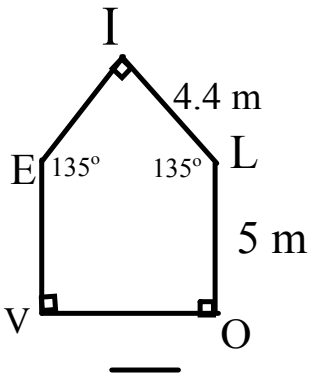
____ = ____

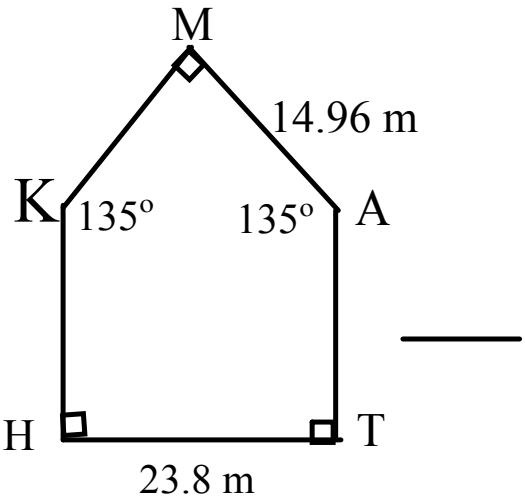
x = cm

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





$\frac{VO}{23.8} = \frac{4.4}{14.96}$

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

$= 7\text{m}$

$\frac{AT}{5} = \frac{14.96}{4.4}$

$AT = \frac{5(14.96)}{4.4}$

$= 17\text{m}$

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

Then set them equal and cross multiply

Class/Homework

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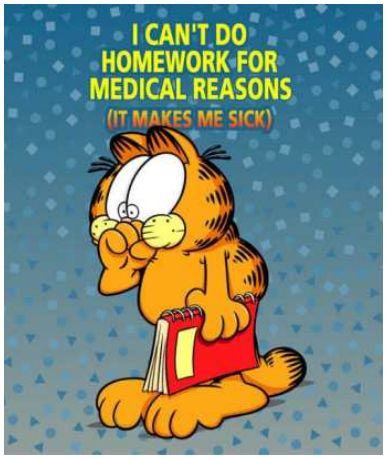

4 (a, d)
5(a,d)
6
9 Show all work
13