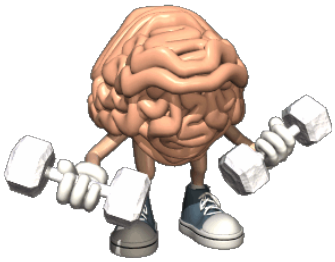
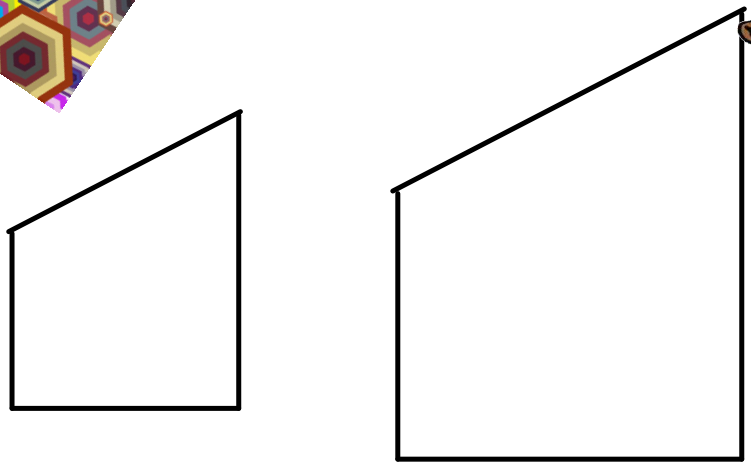
Warm Up



Quiz Tomorrow!

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).

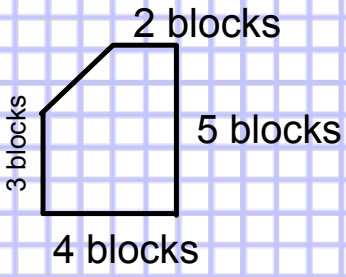
Polygon
(straight sides)

Not a Polygon
(has a curve)

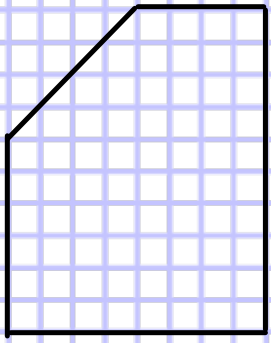
Not a Polygon
(open, not closed)

Activity

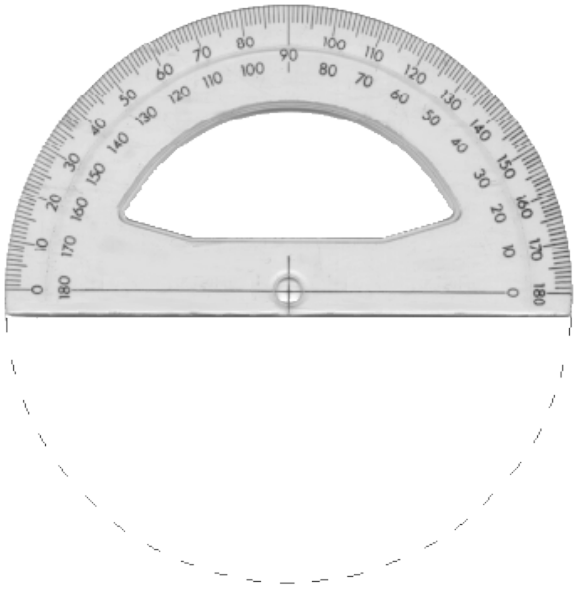
Original Shape



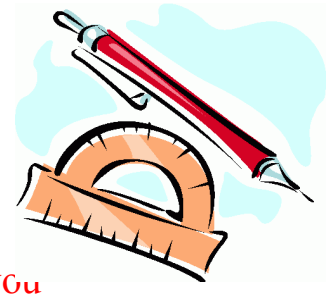
Doubled



Lets double the size of this shape



Your turn



-Each student will get a polygon on a piece of graph paper

-Label the length of each side by counting the blocks(that you can easily count)

- Measure all angles with a protractor

-On the same piece of graph paper double the same shape

- Measure the lengths of the sides by counting blocks

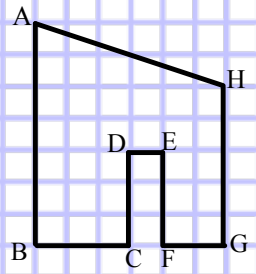
-Measure the angles of the second shape with the protractor

Label the first polygon
ABCDEFGH

Activity

Label your second polygon
IJKLMNOP
counterclockwise

Original Shape



Doubled

Lets double the size of this shape

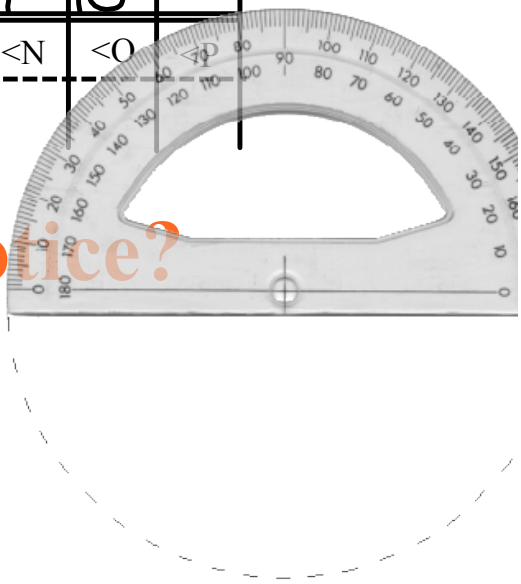
Original

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

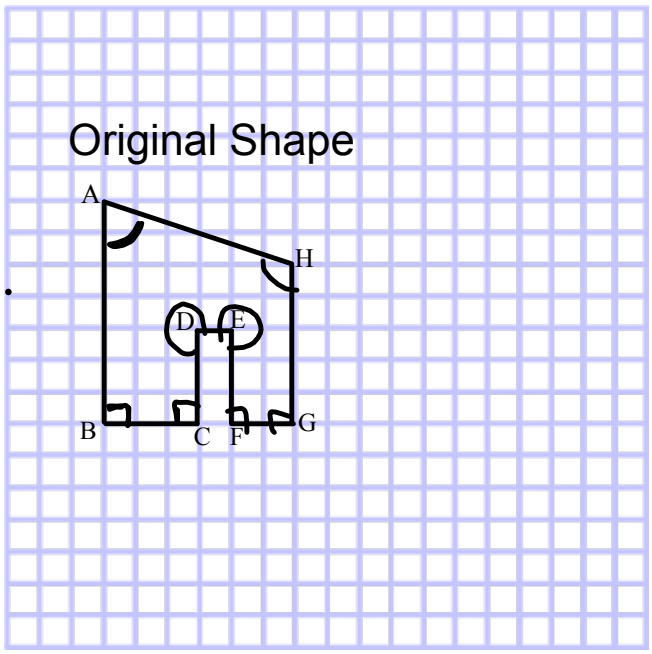
Doubled

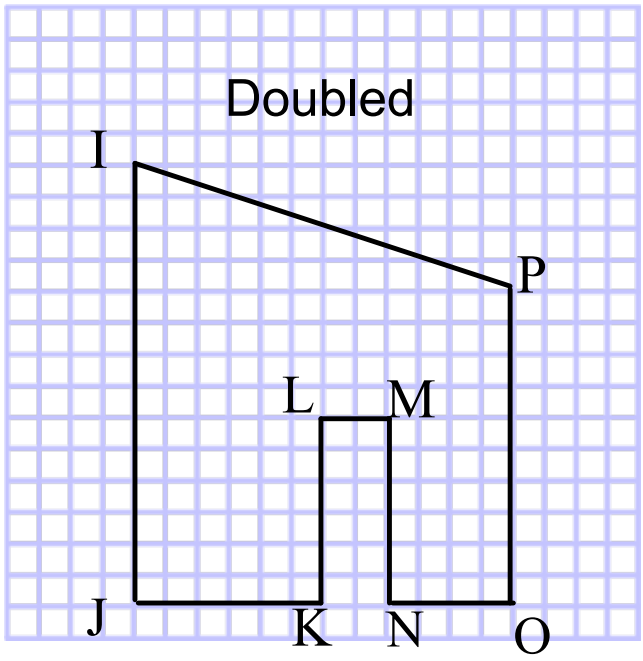
Length of sides (cm)	IJ	JK	KL	LM	MN	NO	OP	PI
	14	6	6	2	6	4	10	
Measure of Angle (degrees)	<I	<J	<K	<L	<M	<N	<O	<P

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 ANGLESBETWEEN SCALED SIDES ARE THE SAME

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

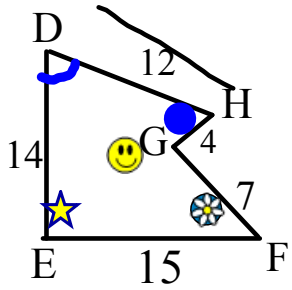
Corresponding: similar in position or purpose
: the same size; reduced or enlarged
- between same scaled sides

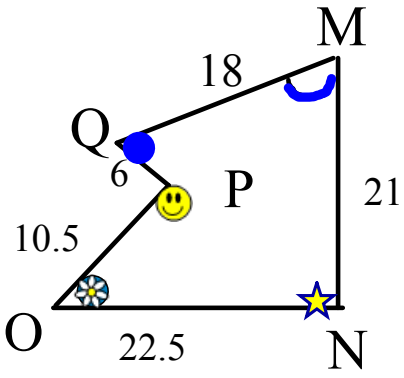
Properties of Similar Polygons
Their corresponding angles are equal Their corresponding sides are proportional

BOTH MUST BE TRUE

Symbol for similar is $\sim$

Are the following Similar Polygons?





Step1) Match up the Angles

$\angle D = \angle M$ $\angle F = \angle O$ $\angle H = \angle Q$

$\angle E = \angle N$ $\angle G = \angle P$

Step 2) Match up sides and compare their ratio

$$\frac{DH}{MQ} = \frac{HG}{QP} = \frac{GF}{PO} = \frac{EF}{NO} = \frac{DE}{MN}$$

Big over Small

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

Put in the Values

$$\frac{12}{18} = \frac{4}{6} = \frac{7}{10.5} = \frac{15}{22.5}$$

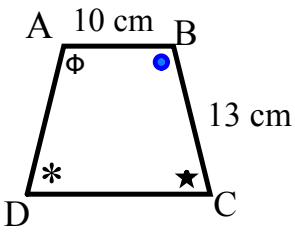
$0.6 \quad 0.6 \quad 0.6 \quad 0.6$

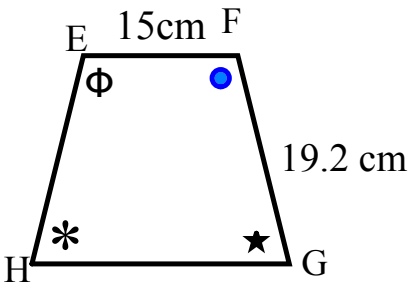
$$\frac{14}{21}$$

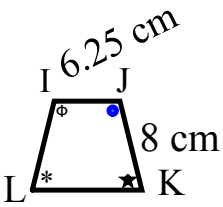
0.6

Identifying Similar Polygons

Which two polygons are similar?





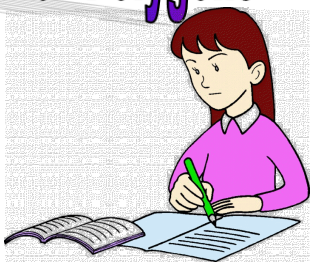


Compare Polygon ABCD and EFGH

Compare Polygon EFGH and IJKL

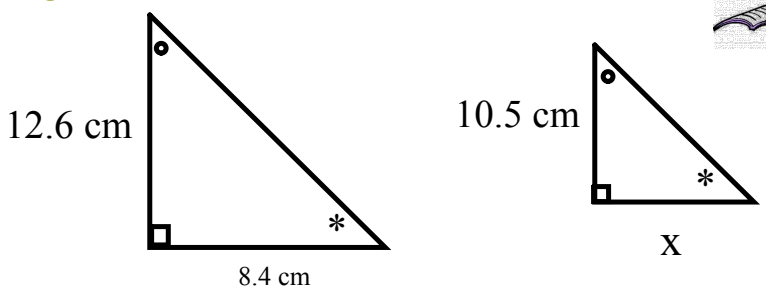
Compare Polygon ABCD and IJKL

Solving Problems Using the Properties of Similar Polygons



Example 1)

Find the length of the side labled "x"



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

Cross Multiply

$$\frac{12.6\text{ cm}}{10.5\text{ cm}} \times \frac{8.4\text{ cm}}{x}$$

$$(12.6\text{cm})\,x = (8.4\text{cm})(10.5\text{cm})$$

$$12.6x = 88.2$$

solve for "x"

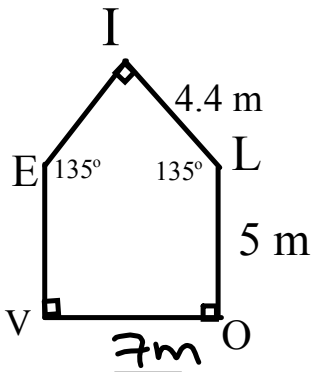
$$\frac{12.6x}{12.6} = \frac{88.2}{12.6}$$

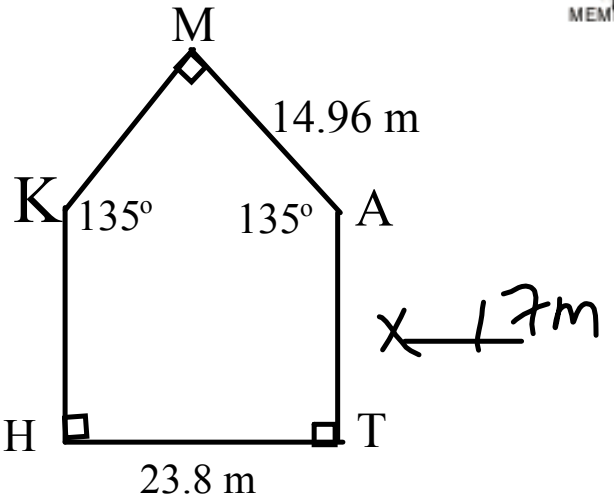
$$x = 7\text{ cm}$$

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





x 17m

7m

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

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

Then set them equal and cross multiply

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

$\frac{AT}{LO} = \frac{HT}{VO}$

$\frac{X}{5} = \frac{23.8}{7}$

$\frac{14.96X}{14.96} = \frac{104.72}{14.96}$

$X = 7$

Class/Homework

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4, 5, 6
9 Show work
11 Show work
13, Show work