

Curriculum Outcomes:

(SS3) Demonstrate an understanding of similarity of polygons.

(SS4) Draw and interpret scale diagrams of 2-D shapes.

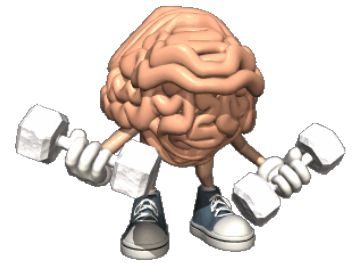
(SS5) Demonstrate an understanding of line and rotation symmetry.

Student Friendly:

How are diagrams related in size? To increase a length by a certain number be it a fraction or a whole number.

Quiz

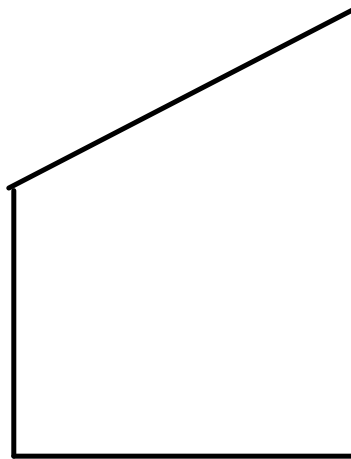
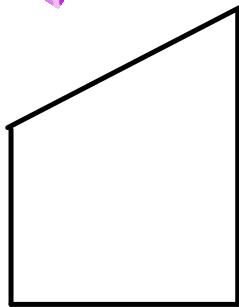
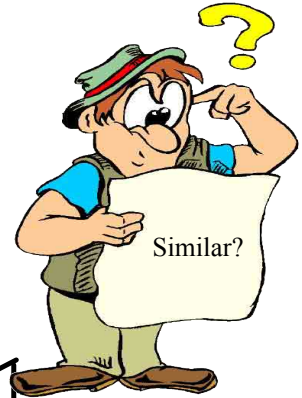
Tomorrow





SECTION 7.3

Similar Polygons



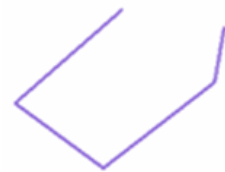
Polygons are 2-dimensional shapes. They are made of straight lines, and the shape is "closed" (all the lines connect up).



Polygon
(straight sides)

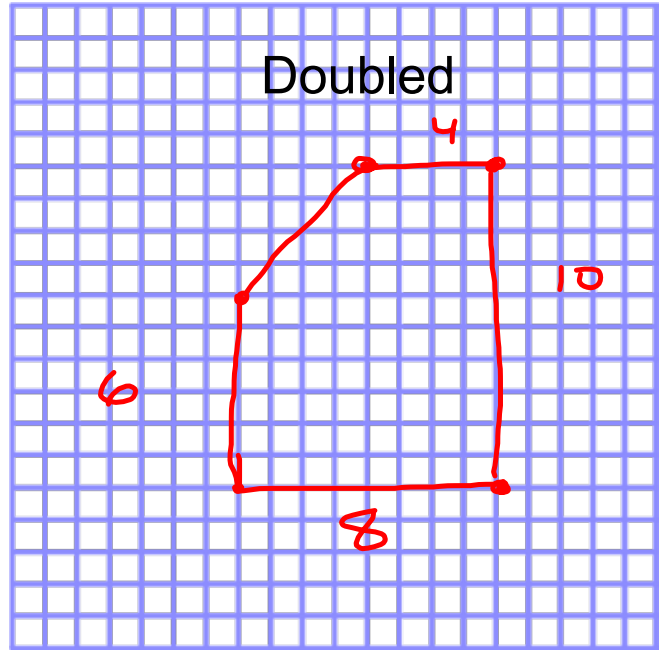
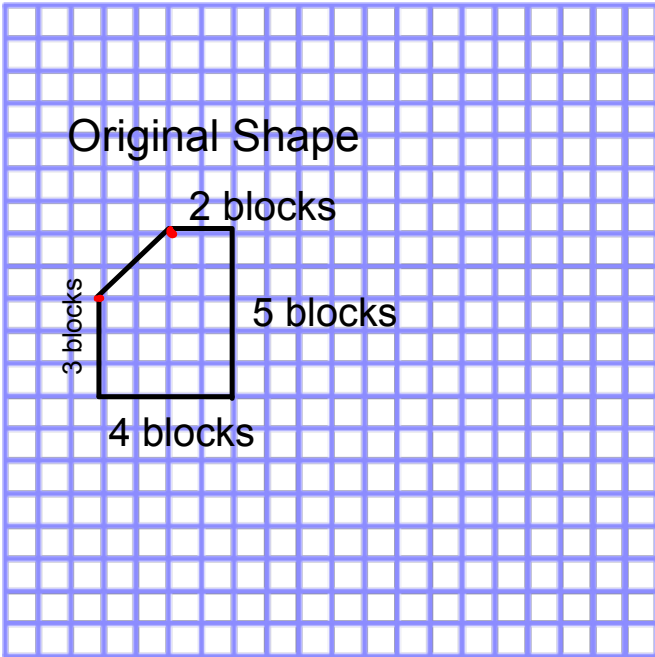


Not a Polygon
(has a curve)

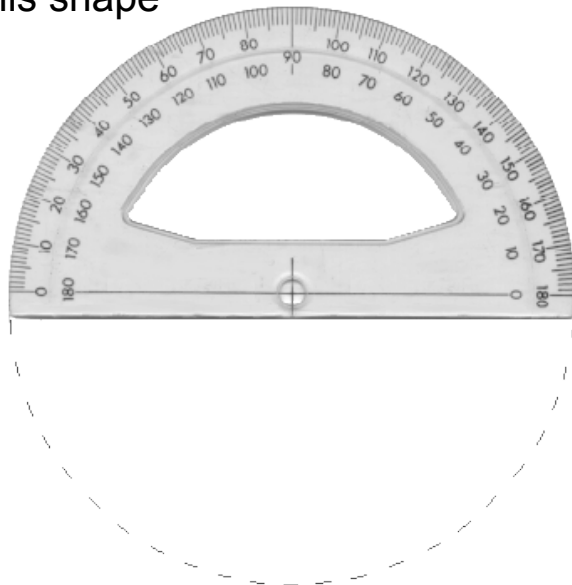


Not a Polygon
(open, not closed)

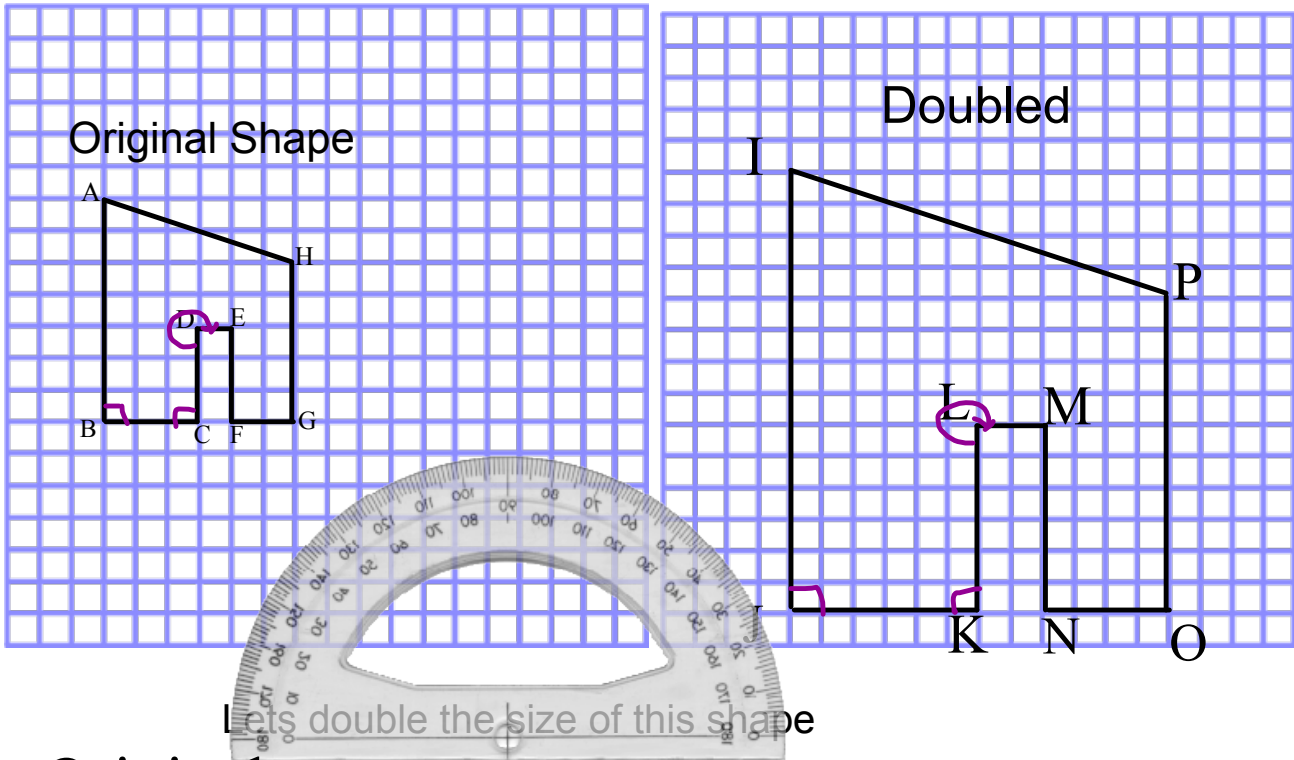
Activity



Lets double the size of this shape



Activity



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

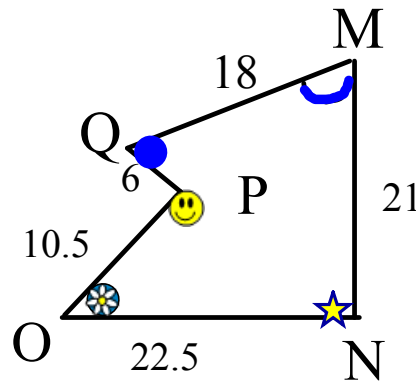
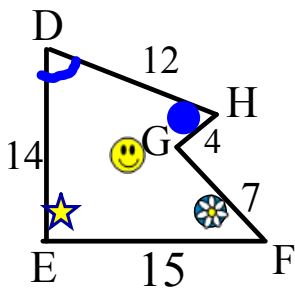
Corresponding similar in position or purpose
: the same size; reduced or enlarged
- between same scaled sides

Properties of Similar Polygons
Their corresponding angles are <u>equal</u>
Their corresponding sides are <u>proportional</u>

BOTH
MUST BE
TRUE

Symbol for similar is \sim

Are the following Similar Polygons?



Step 1) Match up the Angles

$$\begin{aligned} \angle D &= \angle M \\ \angle H &= \angle Q \\ \angle G &= \angle P \\ \angle F &= \angle N \\ \angle E &= \angle N \end{aligned}$$

Step 2) Match up sides and compare their ratio

$$\frac{DH}{MQ} = \frac{HG}{QP} = \frac{GF}{PN} = \frac{FE}{ON} = \frac{DE}{MN}$$

Big over Small

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

Put in the Values

$$\frac{12}{18} = \frac{4}{6} = \frac{7}{10.5} = \frac{15}{22.5} = \frac{14}{21}$$

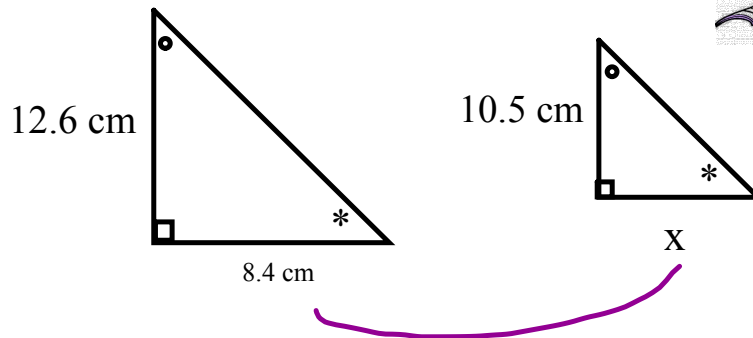
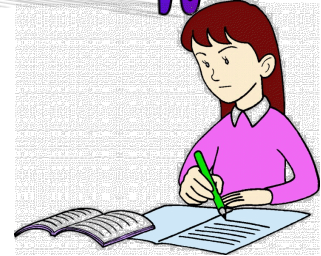
$$0.\overline{6} = 0.\overline{6} = 0.\overline{6} = 0.\overline{6} = 0.\overline{6}$$

poly DHGFE ~ poly MQPON
 (AA or SSS)

Solving Problems Using the Properties of Similar Polygons

Example 1) **Assume similarity**

Find the length of the side labeled "x"



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

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

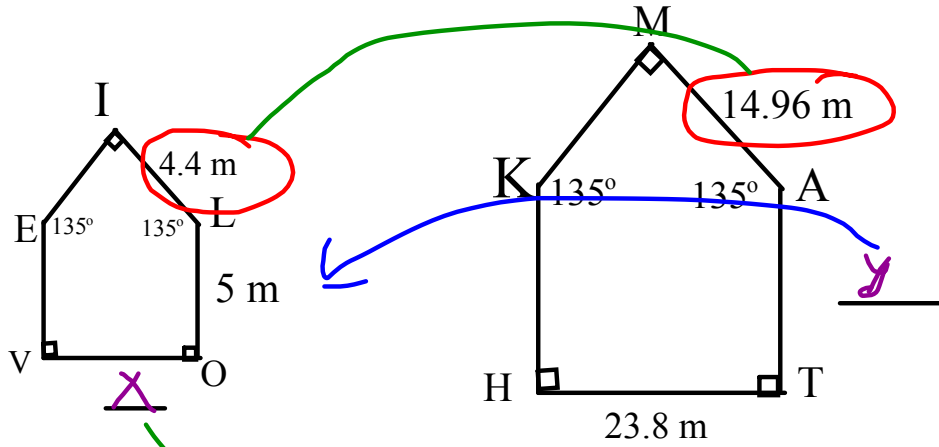
$$x = 7$$

Solving Problems Using the Properties of Similar Polygons

Assume similarity

These two polygons are similar.

Use ratios



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

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

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

$$x = 7$$

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

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

$$y = \frac{5(14.96)}{4}$$

$$y = 17$$

Class/Homework

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4, 5, 6

9 Show work

11 Show work

13, Show work

