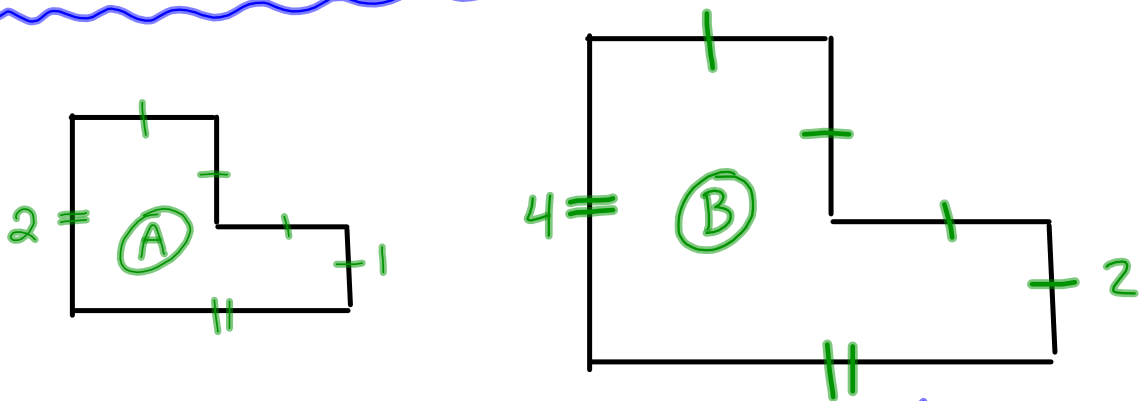


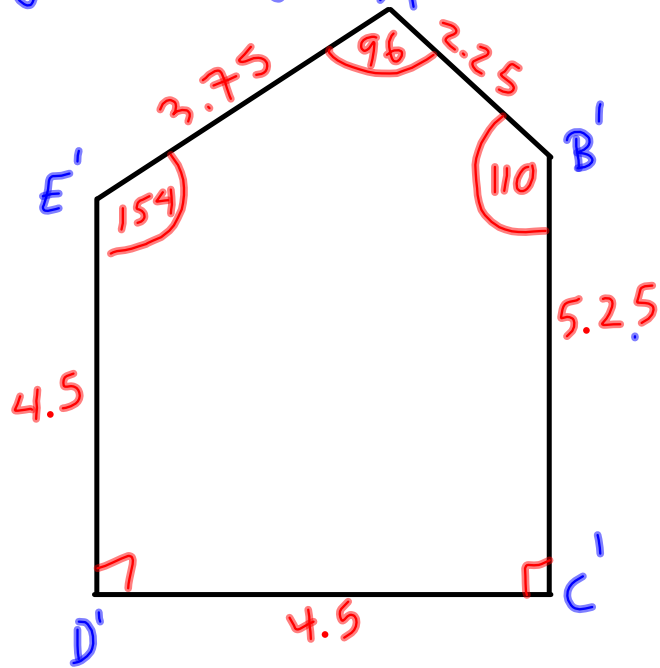
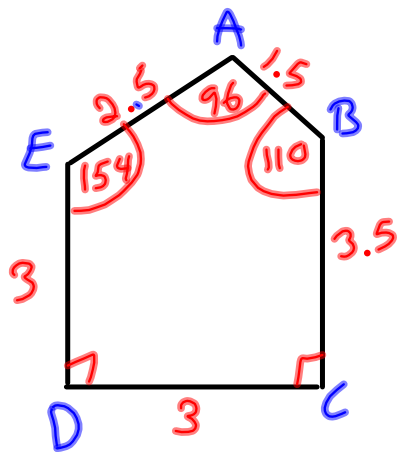
Section 7.3: Similar Polygons



* B is an enlargement of A (sf=2)
 (sf=1/2)
OR * A is a reduction of B

Note: Polygon A & B are similar. Similar polygons have the same shape but not the same size.

Consider the following 2 pentagons:



Note: Matching angles are called corresponding angles

(ex) Since $\angle A = 96$ & $\angle A' = 96$

$\therefore \angle A$ & $\angle A'$ are corresponding angles.

Note 2: Matching sides are called corresponding sides

(ex) AE & $A'E'$ are corresponding sides.

Corresponding Sides - Scale Factor

$AB = 1.5$	$A'B' = 2.25$	$\frac{A'B'}{AB} = \frac{2.25}{1.5} = 1.5$
$BC = 3.5$	$B'C' = 5.25$	$\frac{B'C'}{BC} = \frac{5.25}{3.5} = 1.5$
$CD = 3$	$C'D' = 4.5$	$\frac{C'D'}{CD} = \frac{4.5}{3} = 1.5$
$DE = 3$	$D'E' = 4.5$	$\frac{D'E'}{DE} = \frac{4.5}{3} = 1.5$
$EA = 2.5$	$E'A' = 3.75$	$\frac{E'A'}{EA} = \frac{3.75}{2.5} = 1.5$

Note: Since the quotient of corresponding sides are all equal, the corresponding sides are proportional to each other.

Property: Two polygons are similar if

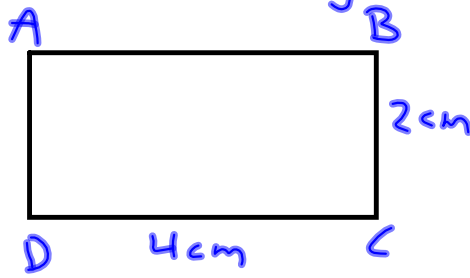
- ① The corresponding angles are equal.
- ② The corresponding sides are proportional.

* If two polygons are similar we use the \sim sign.

(ex) $\triangle ABC$ is similar to $\triangle DEF$
 $\therefore \triangle ABC \sim \triangle DEF$

Ex #1

Given the following rectangle :

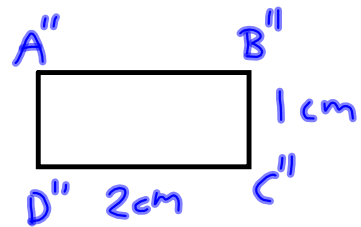


- (a) Draw a larger rectangle similar to the one given
- (b) Draw a smaller rectangle similar to the one given.

A' Ans)



$$A B C D \sim A' B' C' D'$$

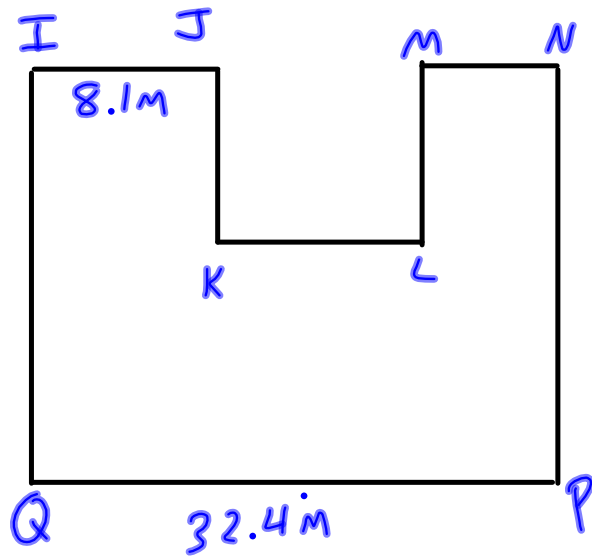
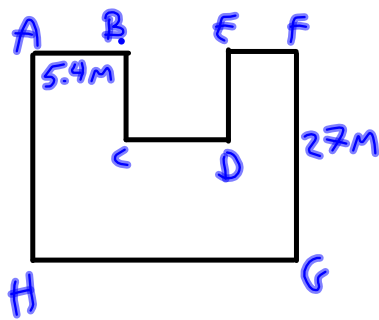


$$A B C D \sim A'' B'' C'' D''$$

NOTE: Th- enlargement + reduction are also similar to each other

$$\circ \circ A' B' C' D' \sim A'' B'' C'' D''$$

Ex #2 The following two octagonal garden plots are similar.



- (a) Calculate the length of GH
 (b) Calculate the length of NP

Note: Use the corresponding sides that we know the lengths of, to solve for the missing sides.

$$\text{Ans) S.F.} = \frac{NEW}{OLD} = \frac{8.1m}{5.4m} = 1.5$$

$$(a) GH = \frac{32.4}{1.5} = 21.6m$$

$$(b) NP = 27 \times 1.5 = 40.5m$$

Homework:
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