

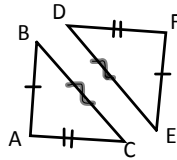
6.1/6.2 Properties of Congruent and Similar Triangles

Congruent Triangles

- identical triangles
- all corresponding angles and all corresponding sides are equal
- same shape and size
- the expression $\triangle ABC \cong \triangle FED$ means that $\triangle ABC$ is congruent to $\triangle FED$

The order of the letters shows correspondence: A F, B E, C D

Ex.1 The following triangles are congruent. Write a congruency statement and state the 6 known equalities.



Conditions for Congruency (3 Theorems)

There are three methods to *prove* triangles are congruent:

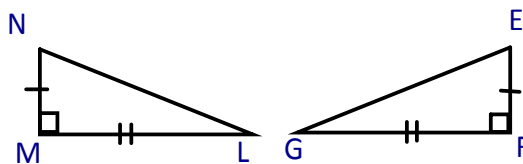
1. SSS --> All sides are equal.
2. SAS --> 2 sides and a CONTAINED angle are equal.
3. ASA/AAS --> 2 angles and a side are equal.



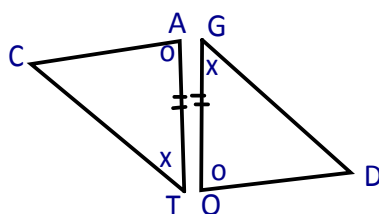
Do you notice which combination is not a congruency theorem?

Ex.2 Prove that the triangles are congruent and name the authority used.

a)



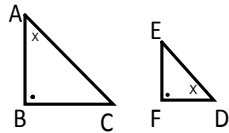
b)



SIMILAR TRIANGLES

- have the same shape BUT a different size
- one triangle is an enlargement/reduction of the other
- the corresponding sides are proportional
- the corresponding angles are equal
- the expression $\triangle ABC \sim \triangle DEF$ means the triangles are similar

Ex. 3 Given similar $\triangle ABC$ and $\triangle DEF$, state the similarity, the known equalities (angles) and the known proportions (sides).

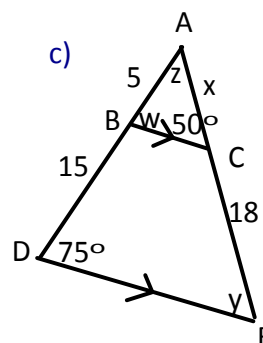
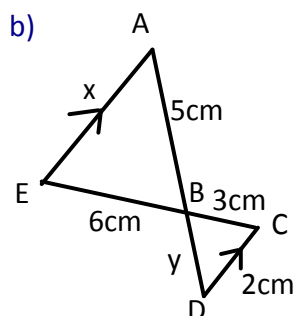
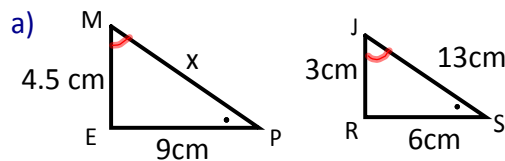


Conditions for Similarity (3 Theorems)

There are 3 methods to *prove* that triangles are similar:

1. SSS --> If 3 pairs of corresponding sides are proportional then the triangles are similar.
2. SAS --> If 2 pairs of corresponding sides are proportional AND the contained angles are equal then the triangles are similar.
3. AA --> If two pairs of corresponding angles are equal then the triangles are similar.

Ex. 4 Prove that the following triangles are similar. Determine the unknowns.



Indirect Measurement:

Using similar triangles to determine distances that are difficult to measure.

Ex.1: On a sunny day, Tanner who is 1.7 m tall and standing by a tree, casts a shadow which is 3.5 m long. The nearby tree casts a shadow of 18.2 m long. How tall is the tree?



Ex 2. Kate is trying to measure the width of a river. She has marked out the following:
How wide is the river?

