

## 7.1 Investigate Properties of Similar Triangles

### A Congruent Versus Similar Figures

Figures may be:

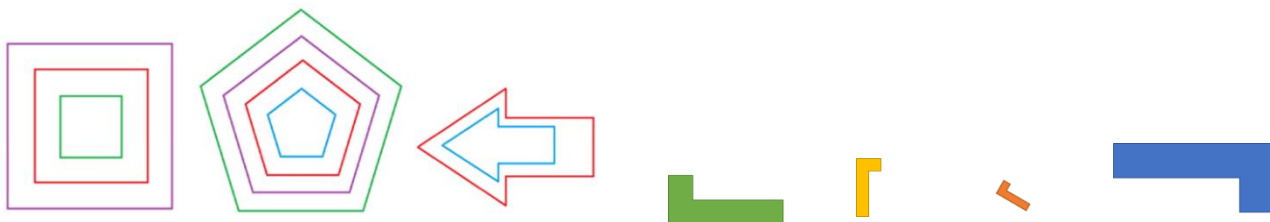
- ✓ *Congruent* if they have *identical shapes* and *same size*

Note. If two figures are congruent, one can be obtained from the other by translation, rotation or reflection.



- ✓ *Similar* if they have *identical shapes* but *different size*

Note. If two figures are similar, one can be obtained from the other by uniformly scaling (enlarging or reducing), possibly with additional translation, rotation and reflection.

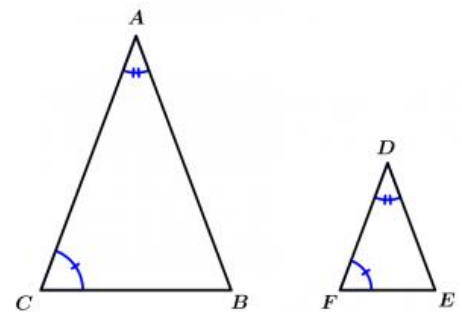


### B AAA Theorem of Similar Triangles

Two triangles are similar if the corresponding angles are congruent (equal).

$$\text{If } \begin{array}{l} \angle A = \angle D \\ \angle B = \angle E \\ \angle C = \angle F \end{array} \quad \text{then} \quad \Delta ABC \sim \Delta DEF$$

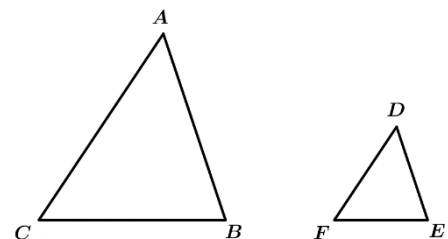
(similarity statement)



### B SSS Theorem of Similar Triangles

Two triangles are similar if the corresponding sides are proportional.

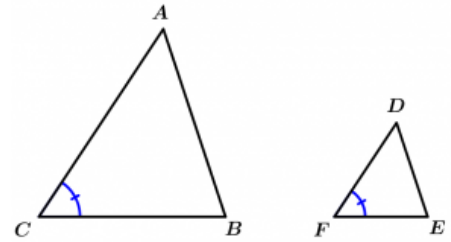
$$\text{If } \frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD} \quad \text{then} \quad \Delta ABC \sim \Delta DEF$$



## B SAS Theorem of Similar Triangles

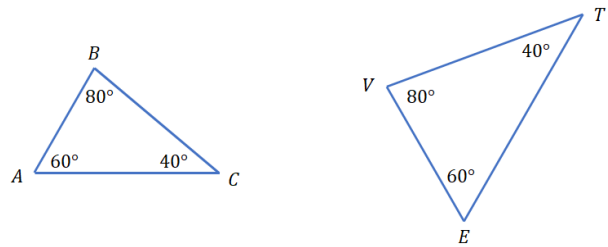
Two triangles are similar if an angle of one triangle is congruent to an angle of a second triangle, and the sides that include the congruent angles are proportional.

If  $\frac{CA}{FD} = \frac{CB}{FE}$   
 $\angle C = \angle F$  then  $\Delta ABC \sim \Delta DEF$

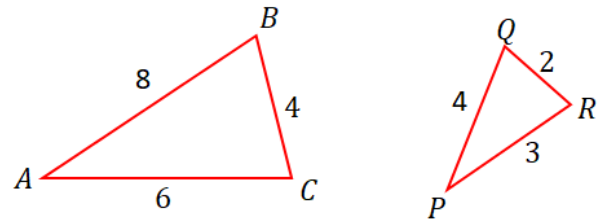


Example 1. For each case, verify if the two triangles are or not similar. If they are similar, specify why and write the similarity statement.

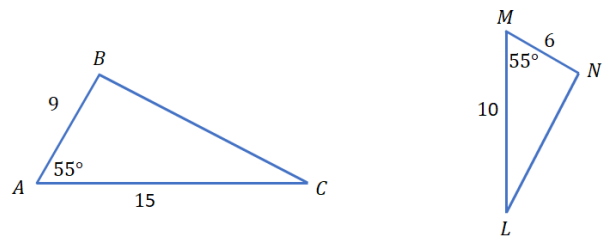
a)



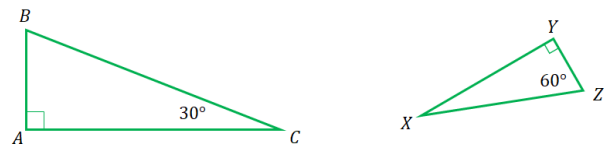
b)



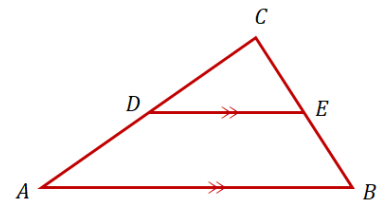
c)



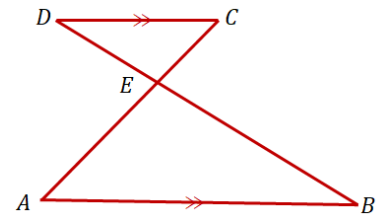
d)



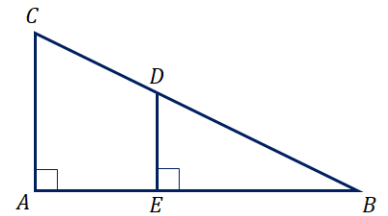
e)



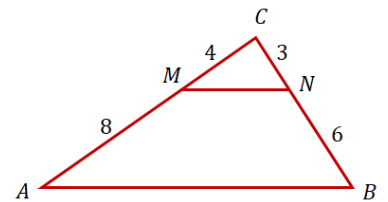
f)



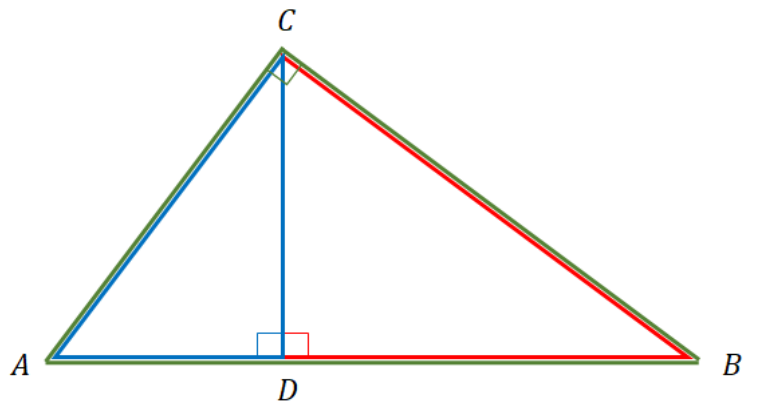
g)



h)



Example 2. Identify similar triangles in the following diagram.



Notes: Textbook Pages 330-333

Homework: Textbook Pages 333-335 # 5, 7, 8, 14, 15