

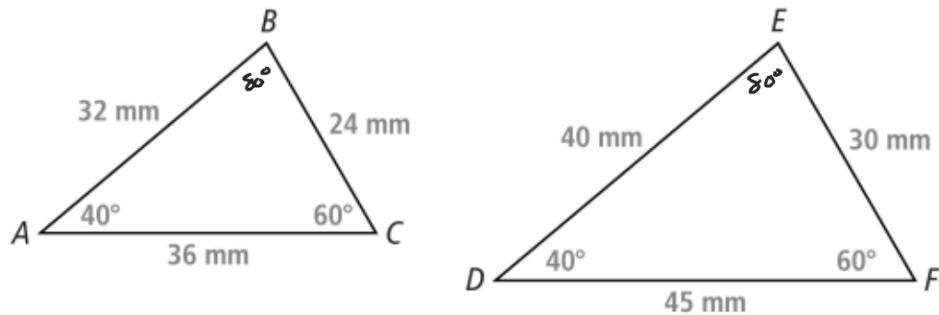
Similar Figures

Definition of Similar Figures

1) Corresponding \angle 's are \cong .

2) Corresponding sides are in
the same $\boxed{\text{Ratio}}$ \longrightarrow Scale Factor
(Proportional)

The measurements of two triangles are shown.



A. Are the triangles similar? Explain.

$$\frac{AC}{DF} = \frac{BC}{EF} = \frac{AB}{DE}$$

$$\frac{36}{45} = \frac{24}{30} = \frac{32}{40}$$

$$\frac{4}{5} = \frac{4}{5} = \frac{4}{5}$$

$$\angle A \cong \angle D$$

$$\angle C \cong \angle F$$

$$\angle B \cong \angle E$$

Yes

1) Corresponding ∠'s \cong

2) Corresponding sides proportional

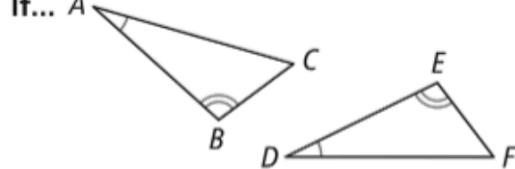
Angle-Angle Similarity ($\text{AA} \sim$) Theorem

If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.

PROOF: SEE EXERCISE 10.

Similar

If... A



$\angle A \cong \angle D$ and $\angle B \cong \angle E$

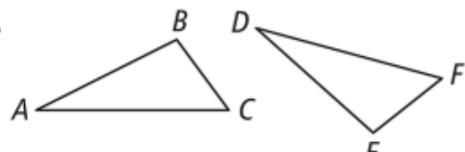
Then... $\triangle ABC \sim \triangle DEF$

Side-Side-Side Similarity (SSS ~) Theorem

If the corresponding sides of two triangles are proportional, then the triangles are similar.

PROOF: SEE EXERCISE 20.

If...



$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

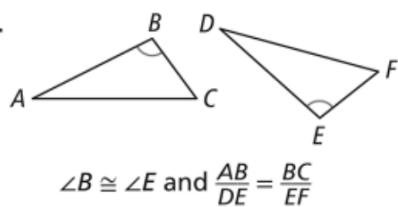
Then... $\triangle ABC \sim \triangle DEF$

Side-Angle-Side Similarity (SAS ~) Theorem

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

PROOF: SEE EXERCISE 13.

If...



Then... $\triangle ABC \sim \triangle DEF$

Verify Triangle Similarity

< ● ○ ○ >

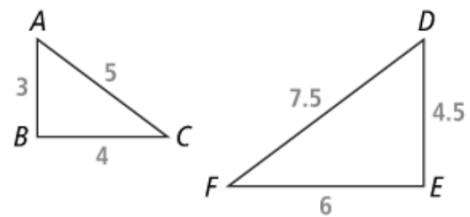


COMMON ERROR

► A. Are $\triangle \bar{ABC}$ and $\triangle \bar{DEF}$ similar?

SOLUTION

$$\frac{\frac{3}{4.5}}{\frac{4}{6}} = \frac{4}{6} = \frac{5}{7.5}$$



Yes $\triangle ABC \sim \triangle DEF$
by SSS

B. Are $\triangle \underline{\underline{PQS}}$ and $\triangle \underline{\underline{RQP}}$ similar?

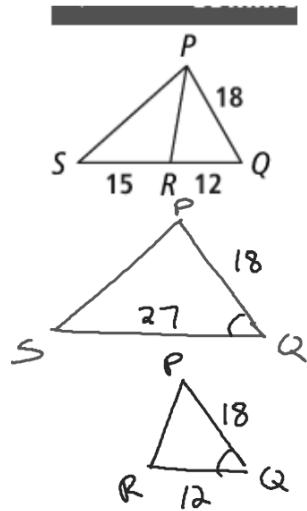
SOLUTION

$$\frac{PQ}{RQ} = \frac{SQ}{QP}$$

$$\frac{18}{12} = \frac{27}{18}$$

$\triangle PQS \sim \triangle RQP$

by SAS



3. a. Is $\triangle ADE \sim \triangle ABD$? Explain.

Enter your answer
 $\frac{2.4}{3.2} = \frac{1.8}{2.4} = \frac{1.8}{2.4}$

$\triangle ADE \sim \triangle ABD$
by SSS

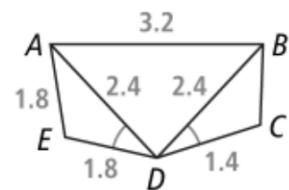
CHECK ANSWER

b. Is $\triangle ADE \sim \triangle BDC$? Explain.

No sides are not proportional.

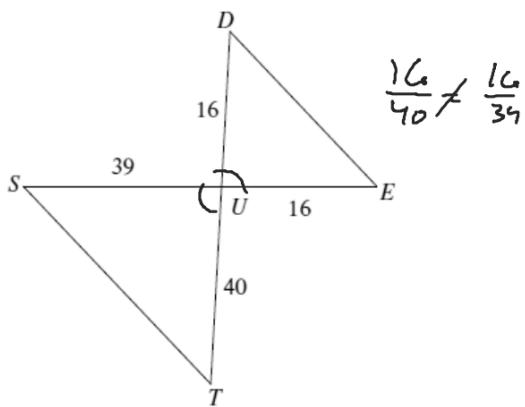
$$\frac{AD}{BD} = \frac{DE}{DC}$$

$$\frac{2.4}{2.4} \neq \frac{1.8}{1.4}$$

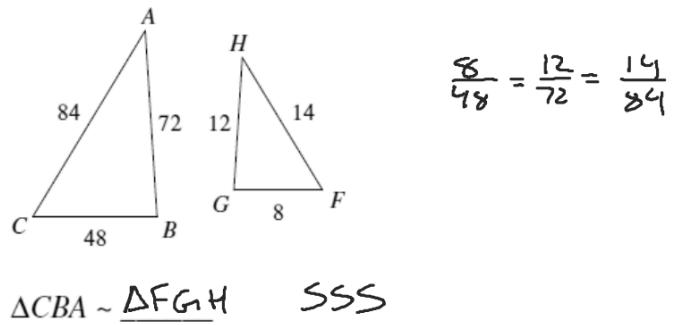


State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

1)

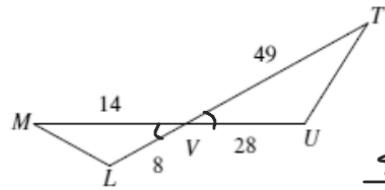


2)



$\Delta UTS \sim \underline{\hspace{2cm}}$

3)

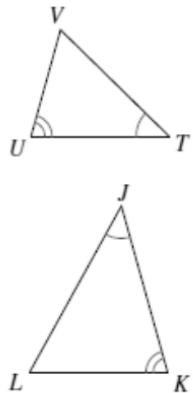


$$\frac{8}{28} = \frac{14}{49}$$

$\Delta VUT \sim \Delta VLM$

SAS

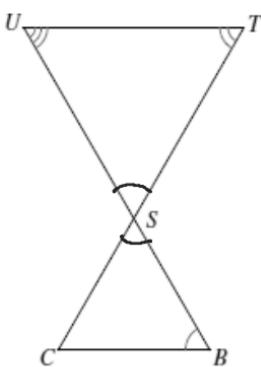
4)



AA

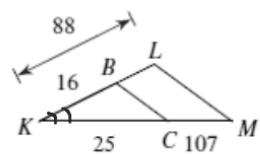
$\Delta JKL \sim \Delta TUV$

5)



$\Delta STU \sim \underline{\hspace{2cm}}$

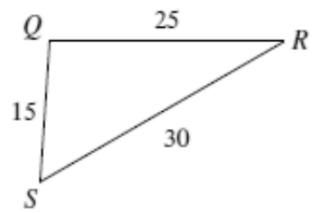
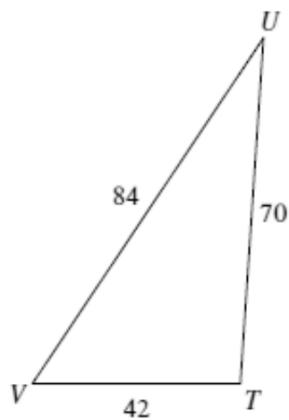
6)



$\Delta KLM \sim \underline{\hspace{2cm}}$

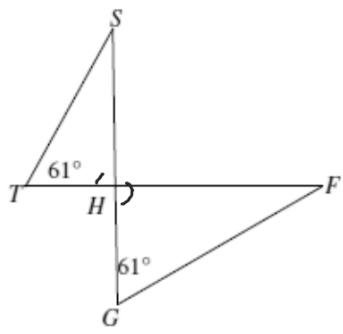
$$\frac{16}{88} \neq \frac{25}{107}$$

7)



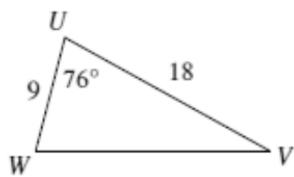
$$\Delta TUV \sim \underline{\hspace{2cm}}$$

9)

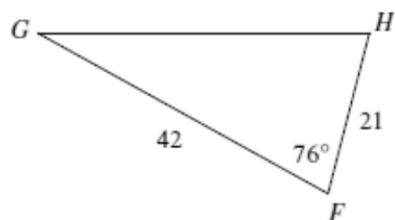


$$\Delta HGF \sim \underline{\hspace{2cm}}$$

10)



$$\frac{21}{9} = \frac{12}{\underline{\hspace{2cm}}}$$



$$\Delta FGH \sim \underline{\hspace{2cm}}$$