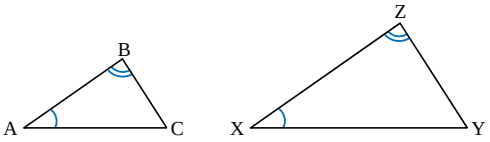
Lesson 7-3

Objective – To prove triangles similar using AA, SSS, and SAS.

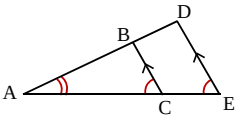
AA Postulate

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



$\triangle ABC \sim \triangle XZY$

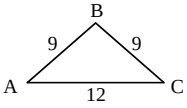
Given: $\overline{BC} \parallel \overline{DE}$
Prove: $\triangle ABC \sim \triangle ADE$

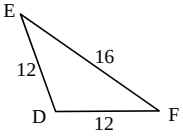


Statement	Reasons
1) $\overline{BC} \parallel \overline{DE}$	Given
2) $\angle BCA \cong \angle DEA$	Corres. $\angle$s Postulate
3) $\angle A \cong \angle A$	Reflexive Prop. of $\cong$
4) $\triangle ABC \sim \triangle ADE$	AA Simlarity

SSS Similarity

If three sides of one triangle are proportional to three corresponding sides of another triangle, then the triangles are similar.





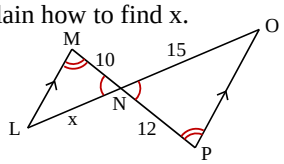
$\frac{AB}{ED} = \frac{9}{12} = \frac{3}{4}$

$\frac{BC}{DF} = \frac{9}{12} = \frac{3}{4}$

$\frac{AC}{EF} = \frac{12}{16} = \frac{3}{4}$

$\therefore \triangle ABC \sim \triangle EDF$

Explain how to find x.



$\angle MNL \cong \angle PNO$ by Reflexive Prop of $\cong$.

$\angle M \cong \angle P$ by Alternate Interior $\angle$s Thm.

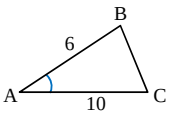
$\therefore \triangle MNL \sim \triangle PNO$ by AA Similarity.

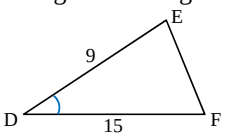
$\therefore \frac{MN}{PN} = \frac{LN}{NO}$ $\therefore \frac{10}{12} \times \frac{x}{15}$

$150 = 12x$ $x = 12.5$

SAS Similarity

If two sides of one triangle are proportional to two sides of another triangle and the included angles are congruent, then the triangles are congruent.





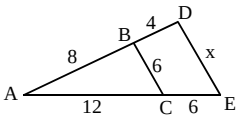
$\frac{AB}{DE} = \frac{6}{9} = \frac{2}{3}$

$\frac{AC}{DF} = \frac{10}{15} = \frac{2}{3}$

$\angle A \cong \angle D$

$\therefore \triangle ABC \sim \triangle DEF$

Explain how to find x.



It is given in the drawing, $\frac{AB}{AD} = \frac{8}{12} = \frac{2}{3}$, and $\frac{AC}{AE} = \frac{12}{18} = \frac{2}{3}$.

$\therefore \frac{AB}{AD} = \frac{AC}{AE}$ by substitution.

$\angle A \cong \angle A$ by Reflexive Prop of $\cong$.

$\therefore \triangle ABC \sim \triangle ADE$ by SAS Similarity.

$\therefore \frac{12}{18} \times \frac{6}{x}$

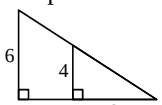
$12x = 108$

$x = 9$

Lesson 7-3

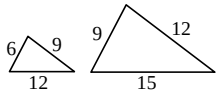
If each pair of triangles is similar, explain why.

1)



Similar by AA Similarity.

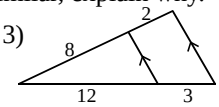
2)



$\frac{12}{15}=\frac{4}{5}$, $\frac{9}{12}=\frac{3}{4}$, $\frac{6}{9}=\frac{2}{3}$

Not Similar

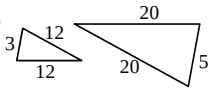
3)



$\frac{8}{10}=\frac{4}{5}$, $\frac{12}{15}=\frac{4}{5}$

Similar by SAS Similarity.

4)

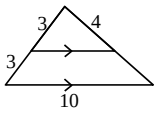


$\frac{12}{20}=\frac{3}{5}$, $\frac{3}{5}$

Similar by SSS Similarity.

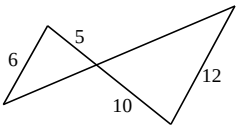
If each pair of triangles is similar, explain why.

5)



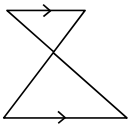
Similar by AA Similarity.

6)



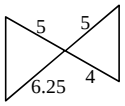
Not Similar

7)



Similar by AA Similarity.

8)



$\frac{5}{6.25}=\frac{4}{5}$

Similar by SAS Similarity.