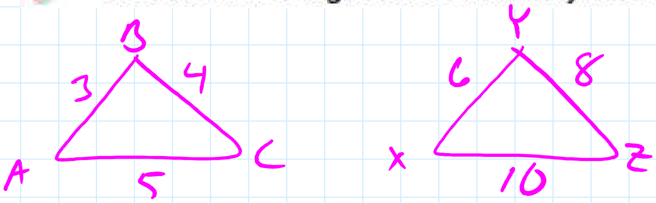
What You Will Learn

SSS
SAS

- Use the Side-Side-Side Similarity Theorem.
- Use the Side-Angle-Side Similarity Theorem.



$\triangle ABC \sim \triangle XYZ$

$$\frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ}$$

$$\frac{3}{6} = \frac{4}{8} = \frac{5}{10}$$

$$\frac{1}{2} = \frac{1}{2} = \frac{1}{2}$$

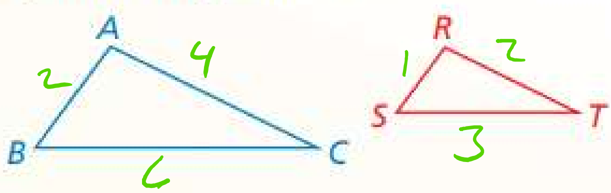
$$\frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ}$$

$$\frac{3}{3} = \frac{4}{4} = \frac{5}{5}$$

$$1 = 1 = 1$$

Theorem 8.4 Side-Side-Side (SSS) Similarity Theorem

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



If $\frac{AB}{RS} = \frac{BC}{ST} = \frac{CA}{TR}$, then $\triangle ABC \sim \triangle RST$.

Is either $\triangle PQR$ or $\triangle STU$ similar to $\triangle VWX$?

20 U

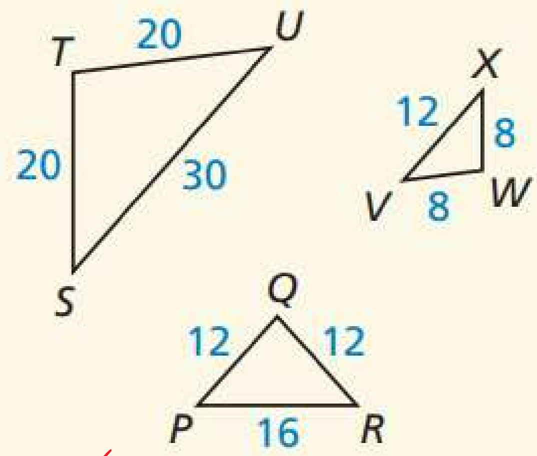
$\triangle VWX \overset{?}{\not\sim} \triangle PQR$

$$\frac{VW}{PQ} = \frac{WX}{QR} = \frac{VX}{PR}$$

$\boxed{\triangle VWX \sim \triangle STU}$

$$\frac{VW}{ST} = \frac{WX}{TU} = \frac{VX}{SU}$$

Is either $\triangle PQR$ or $\triangle STU$ similar to $\triangle VWX$?



$\triangle VWX \not\sim \triangle PQR$

$\frac{VW}{PQ} = \frac{WX}{QR} = \frac{VX}{PR}$

$\frac{8}{12} = \frac{8}{12} = \frac{12}{16}$

$\frac{2}{3} = \frac{2}{3} \neq \frac{3}{4}$

Not ~

$\triangle VWX \sim \triangle STU$

$\frac{VW}{ST} = \frac{WX}{TU} = \frac{VX}{SU}$

$\frac{8}{20} = \frac{8}{20} = \frac{12}{30}$

$\boxed{\frac{2}{5} = \frac{2}{5} = \frac{2}{5}}$

yes ~

$\triangle VWX \not\sim \triangle TSU$

$\frac{VW}{TS} = \frac{WX}{SU} = \frac{VX}{TU}$

$\frac{8}{20} = \frac{8}{30} = \frac{12}{20}$

$\frac{2}{5} = \frac{2}{3} = \frac{3}{5}$

Be Careful...
I suggest that you use similarity statements to check to avoid this possibility

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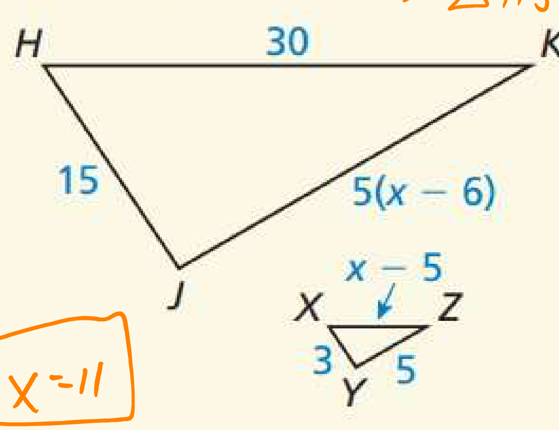
Find the value of x that makes $\triangle XYZ \sim \triangle HJK$.

$\triangle XYZ$
$\triangle HJK$



$\boxed{x = 11}$

$\frac{XY}{HJ} = \frac{YZ}{JK} = \frac{XZ}{HK}$

$\frac{3}{15} = \frac{5}{5(x-6)} = \frac{x-5}{30}$

$\frac{1}{5} = \frac{5}{5(x-6)} = \frac{x-5}{30} \longrightarrow \frac{1}{5} = \frac{5}{5(11-6)} = \frac{11-5}{30}$

$\frac{1}{5} = \frac{5}{25} = \frac{6}{30}$

$\boxed{\frac{1}{5} = \frac{1}{5} = \frac{1}{5}}$

$\frac{1}{5} = \frac{x-5}{30}$

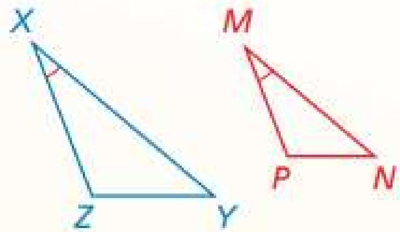
$\frac{\cancel{5}(x-5)}{\cancel{5}} = \frac{30}{5}$

$x - 5 = 6$
$\quad +5 \quad +5$

$x = 11$

Theorem 8.5 Side-Angle-Side (SAS) Similarity Theorem

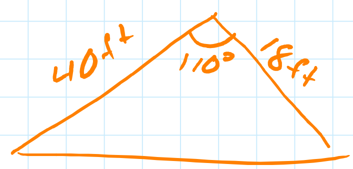
If an angle of one triangle is congruent to an angle of a second triangle and the lengths of the sides including these angles are proportional, then the triangles are similar.



If $\angle X \cong \angle M$ and $\dfrac{ZX}{PM} = \dfrac{XY}{MN}$, then $\triangle XYZ \sim \triangle MNP$.

The diagram is a scale drawing of a triangular roof truss. The lengths of the two upper sides of the actual truss are 18 feet and 40 feet. The actual truss and the scale drawing both have an included angle of 110°. Is the scale drawing of the truss similar to the actual truss? Explain.

Actual Truss



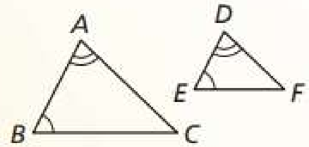
$$\frac{40\text{ ft}}{10\text{ in}} = \frac{18\text{ ft}}{6\text{ in}}$$

$$\boxed{\frac{4}{1} \neq \frac{3}{1}}$$

Not ~

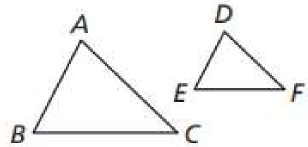
Triangle Similarity Theorems

AA Similarity Theorem



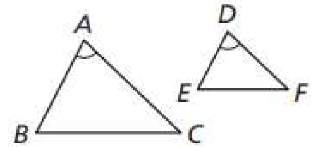
If $\angle A \cong \angle D$ and $\angle B \cong \angle E$, then $\triangle ABC \sim \triangle DEF$.

SSS Similarity Theorem



If $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$, then $\triangle ABC \sim \triangle DEF$.

SAS Similarity Theorem



If $\angle A \cong \angle D$ and $\frac{AB}{DE} = \frac{AC}{DF}$, then $\triangle ABC \sim \triangle DEF$.

We missed you Zach & Jackob

The secret word is: Zebra

Practice sec 8.3 **pg. 441: 2-18A**