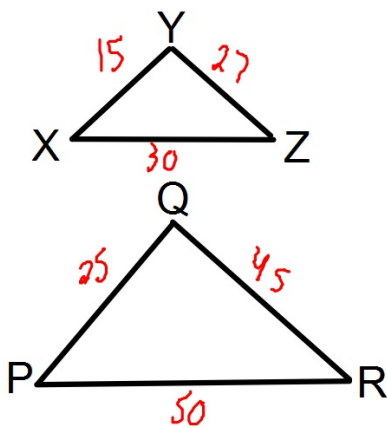


## Bellwork

Given:  $XY = 15$   
 $YZ = 27$   
 $XZ = 30$   
 $PQ = 25$   
 $QR = 45$   
 $PR = 50$

Prove:  $\triangle XYZ \sim \triangle PQR$



Statements	Reasons
① $XY = 15; YZ = 27; XZ = 30$ $PQ = 25; QR = 45; PR = 50$	① Given
② $\frac{XY}{PQ} = \frac{15}{25} = \frac{3}{5}$	② Reduce by 5
③ $\frac{YZ}{QR} = \frac{27}{45} = \frac{3}{5}$	③ Reduce by 9
④ $\frac{XZ}{PR} = \frac{30}{50} = \frac{3}{5}$	④ Reduce by 10
⑤ $\frac{XY}{PQ} = \frac{YZ}{QR} = \frac{XZ}{PR} = \frac{3}{5}$	⑤ Transitive Prop.
⑥ $\triangle XYZ \sim \triangle PQR$	⑥ SSS

## Proving Triangle Similarity

Throughout this unit we will be focusing on several methods of proving two triangles are similar including:

1. Angle-Angle (AA)
2. Side-Side-Side (SSS )
3. Side-Angle-Side (SAS)

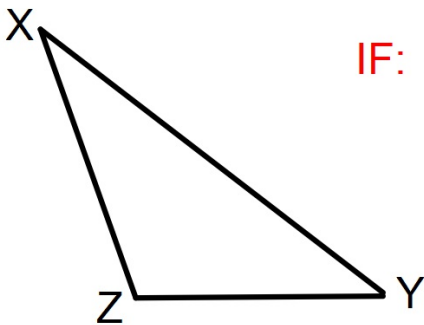
**[This is the main focus of this lesson]**

## Similarity by Side-Angle-Side

Side-Angle-Side (SAS) Similarity Theorem:

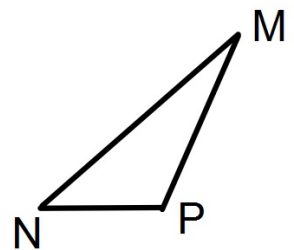
If an angle of one triangle is congruent to an angle of another triangle AND the lengths of the sides including these angles are proportional,

Then the triangles are similar.



$$\text{IF: } \angle X \cong \angle M \text{ and } \frac{ZX}{PM} = \frac{XY}{MN}$$

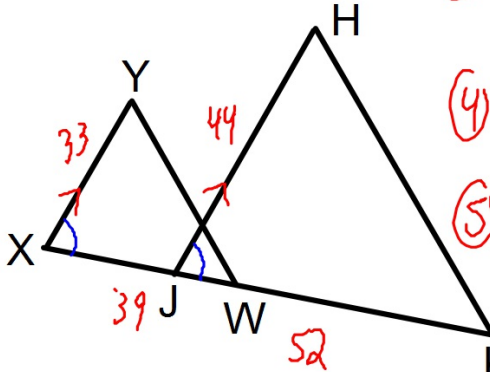
$$\text{THEN: } \triangle XYZ \sim \triangle MNP$$



## Example

**Given:**  $XY = 33$   
 $JH = 44$   
 $XW = 39$   
 $JK = 52$   
 $XY \parallel JH$

**Prove:**  $\triangle XYW \sim \triangle JHK$



Statements	Reasons
① $XY = 33; JH = 44$ $XW = 39; JK = 52$ $XY \parallel JH$	① Given.
② $\frac{XY}{JH} = \frac{33}{44} = \frac{3}{4}$	② Reduce by 11.
③ $\frac{XW}{JK} = \frac{39}{52} = \frac{3}{4}$	③ Reduce by 13
④ $\angle X \cong \angle J$	④ Corresponding $\angle$ 's
⑤ $\frac{XY}{JH} = \frac{XW}{JK} = \frac{3}{4}$	⑤ Tran. Prop
⑥ $\triangle XYW \sim \triangle JHK$	⑥ SAS.