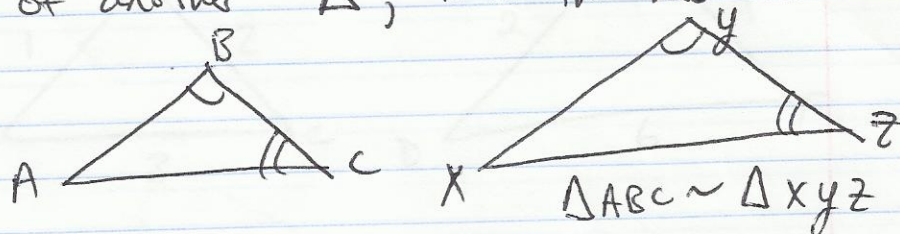


## 7-3 Proving $\Delta$ s Similar

### Angle-Angle Similarity Postulate (AA)

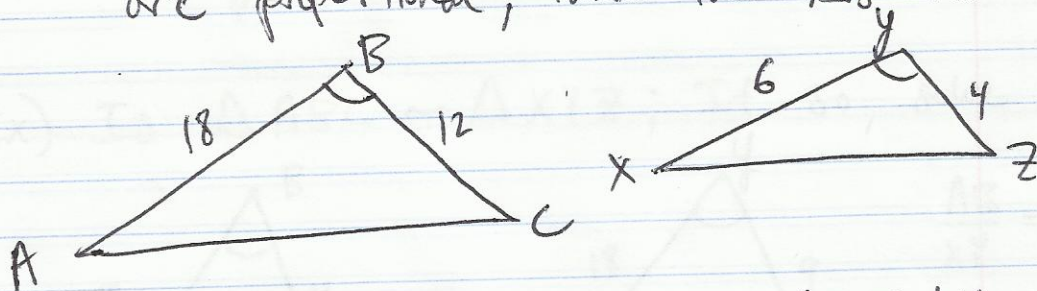
If two  $\angle$ s of one  $\Delta$  are  $\cong$  to 2  $\angle$ s of another  $\Delta$ , then the  $\Delta$ s are  $\sim$ .



Why don't we need all  $\angle$ s  $\cong$ ? If 2  $\angle$  pairs are  $\cong$ , the third pair must be  $\cong$ , by  $\Delta$   $\angle$  sum theorem.

### Side-Angle-Side Similarity (SAS $\sim$ ) Theorem

If an angle in one  $\Delta$  is  $\cong$  to an  $\angle$  in another  $\Delta$ , and the sides making up those  $\angle$ s are proportional, then the  $\Delta$ s are  $\sim$ .



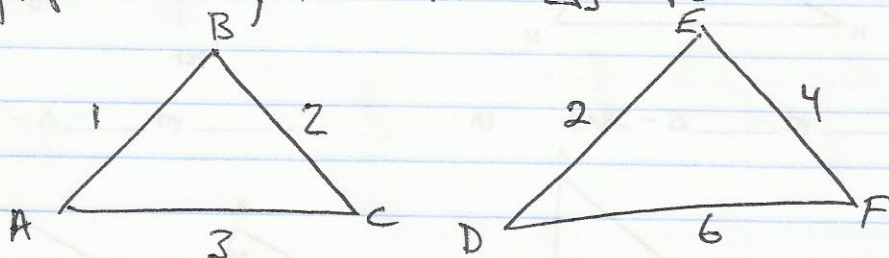
$$\frac{AB}{XY} = \frac{BC}{YZ} = \frac{3}{1} \quad \text{and } \angle B \cong \angle Y$$

$$\text{so } \Delta ABC \sim \Delta XYZ$$



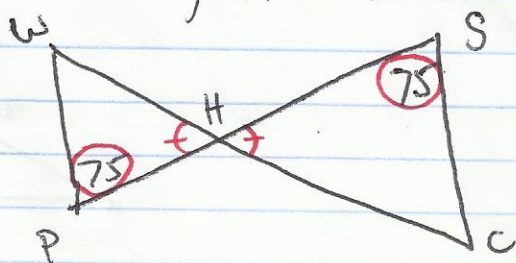
## Side-Side-Side Similarity (SSS~) Theorem

If the corresponding sides of 2  $\Delta$ s are proportional, then the  $\Delta$ s are  $\sim$ .



$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = \frac{1}{2}, \text{ so } \Delta ABC \sim \Delta DEF$$

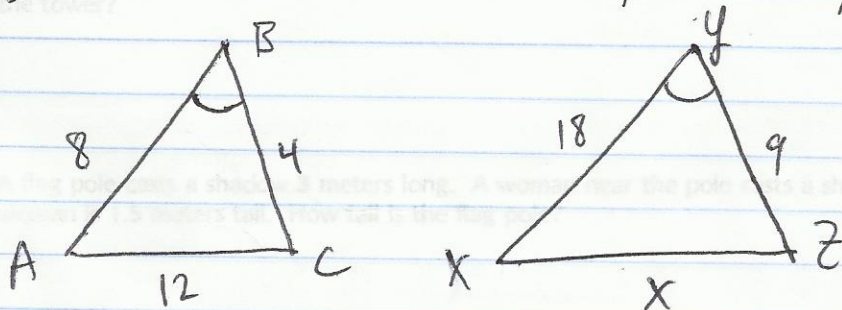
Ex) Are the two  $\Delta$ s  $\sim$ ? If so, write a similarity statement.



$$\Delta WPH \sim \Delta CSH$$

by AA~

Ex) Is  $\Delta ABC \sim \Delta XYZ$ ; If so, solve for x:



$$\frac{AB}{XY} = \frac{8}{18} = \frac{4}{9}$$

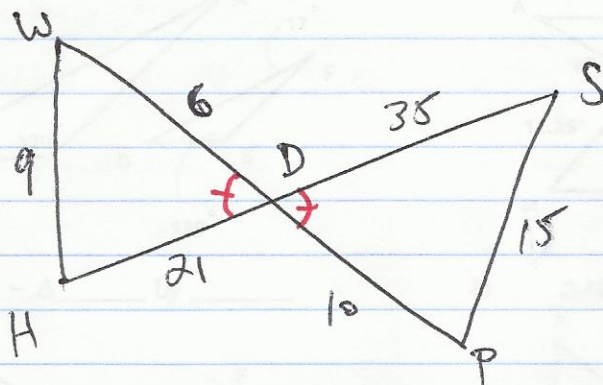
$$\frac{BC}{YZ} = \frac{4}{9}$$

YES,  $\Delta ABC \sim \Delta XYZ$  by SAS~

$$\frac{12}{x} = \frac{4}{9} \rightarrow 4x = 108$$

$$\boxed{x = 27}$$

Ex) Are the  $\Delta$ s similar? Write a similarity statement and name the similarity theorem.



$$\frac{WD}{DP} = \frac{6}{10} = \frac{3}{5}$$

$$\frac{HD}{DS} = \frac{21}{35} = \frac{3}{5}$$

$$\frac{WH}{SP} = \frac{9}{15} = \frac{3}{5}$$

$\triangle WDH \sim \triangle PDS$  by SAS  $\sim$   
or SSS  $\sim$