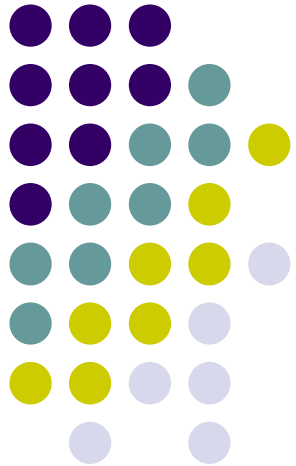
8-3 Proving Triangles Similar

Advanced Geometry



Warm Up

Solve the proportion.

$x = 5$

1) $\frac{3}{x} = \frac{12}{16}$

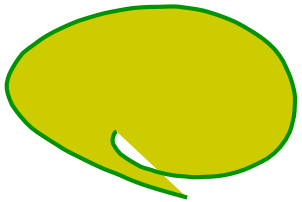
$x = 4$

2) $\frac{6x-2}{7} = \frac{5x+7}{8}$

$8(6x-2) = 7(5x+7)$

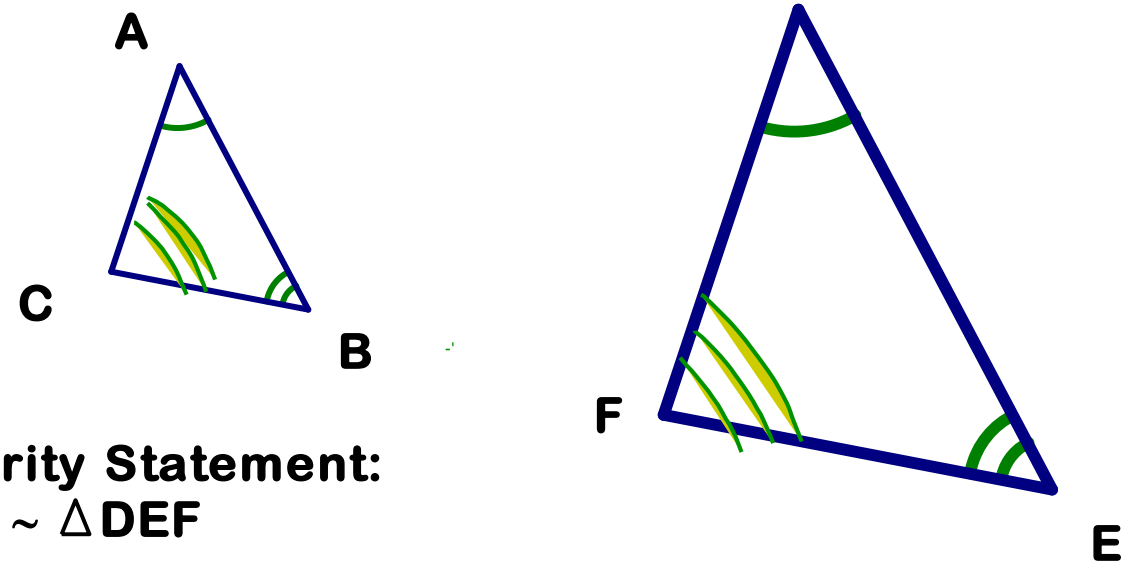
$48x - 16 = 35x + 49$

3) What's the difference between *similar* and *congruent?*



Angle – Angle ~ (AA ~)

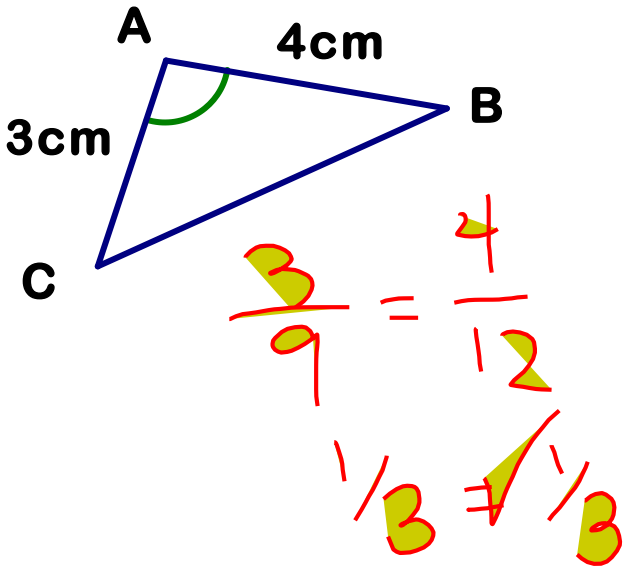
- If two angles of one triangle are congruent to two angles of another triangle, then they are similar

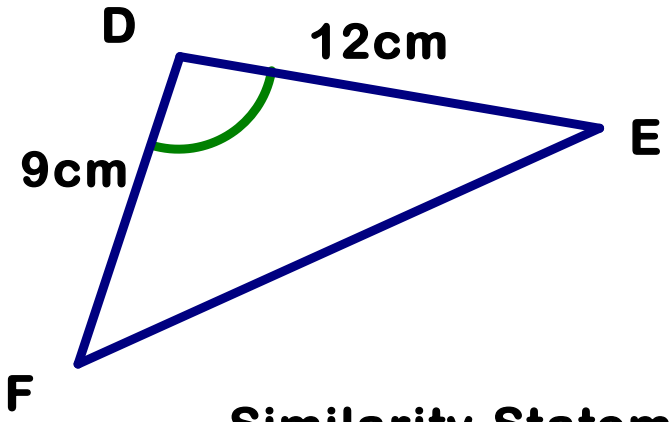


Similarity Statement:
$\Delta ABC \sim \Delta DEF$

Side Angle Side ~ (SAS ~)

- If an angle of one triangle is congruent to an angle of another triangle and the sides including the two angles are [redacted] then the triangles are similar

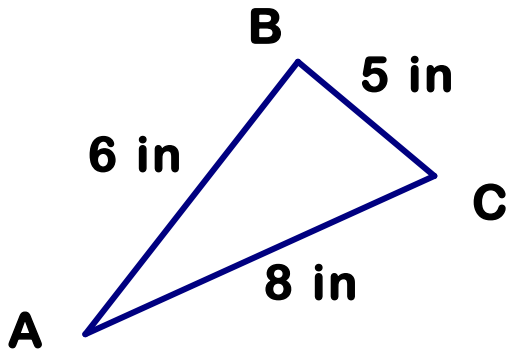


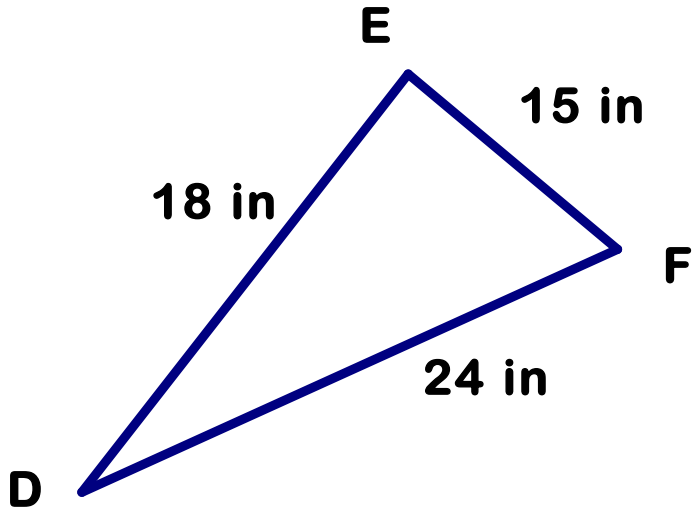


Similarity Statement:
△ABC ~ △DEF

Side Side Side ~ (SSS ~)

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

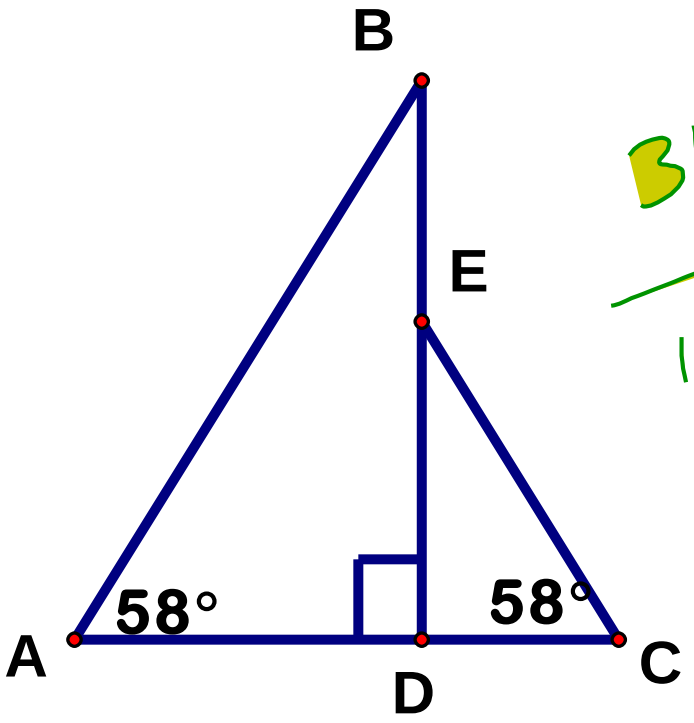




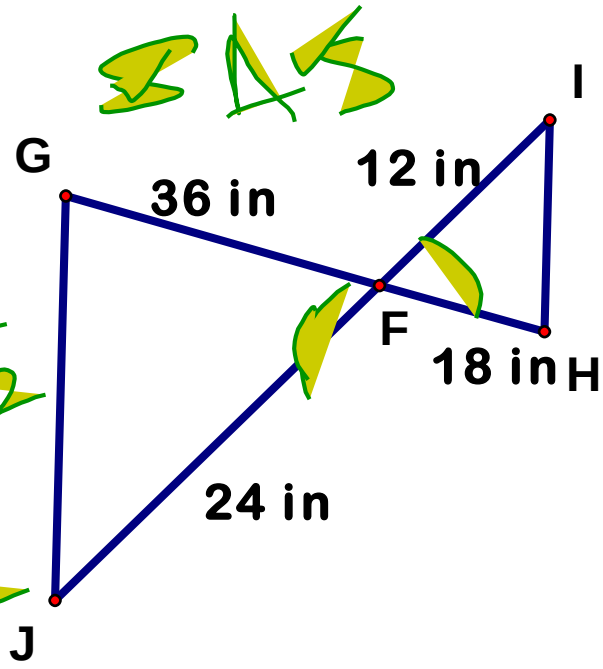
$$\frac{5}{15} = \frac{6}{18} = \frac{8}{24}$$

Similarity Statement:
$\Delta ABC \sim \Delta DEF$

Ex1:
Explain why they are similar



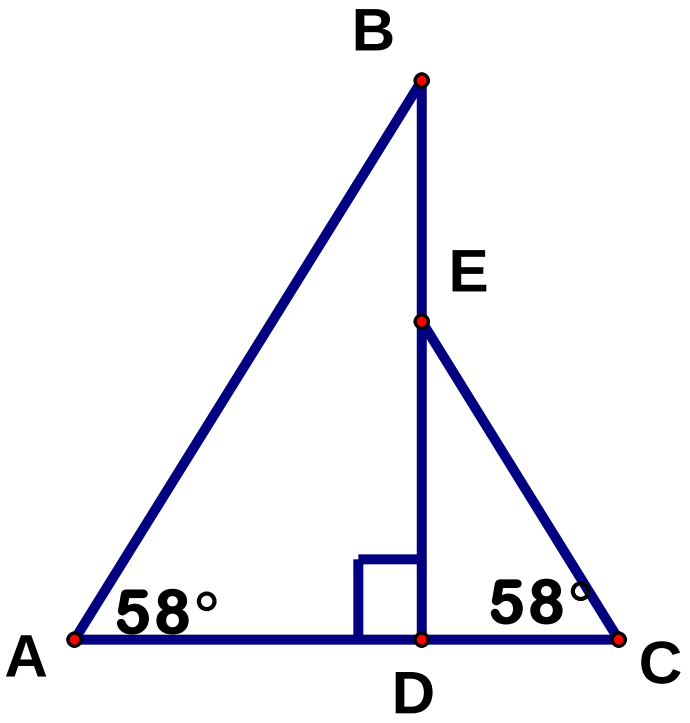
SAS



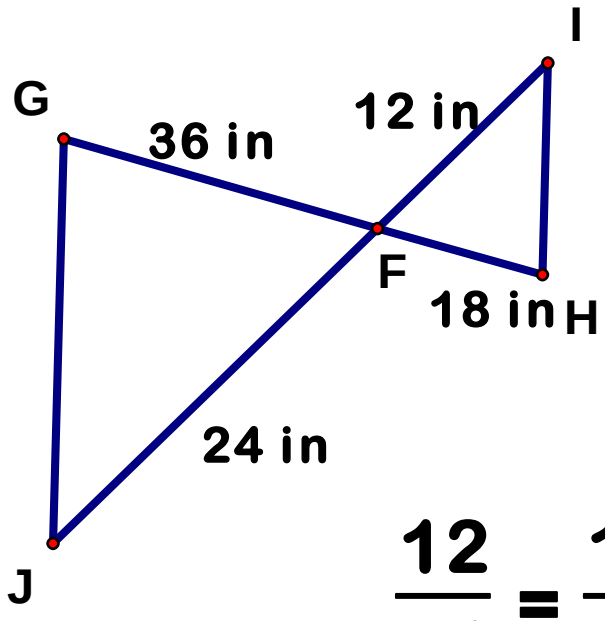
$\frac{36}{18} = \frac{24}{12}$

$2 = 2$

Ex1:
Explain why they are similar



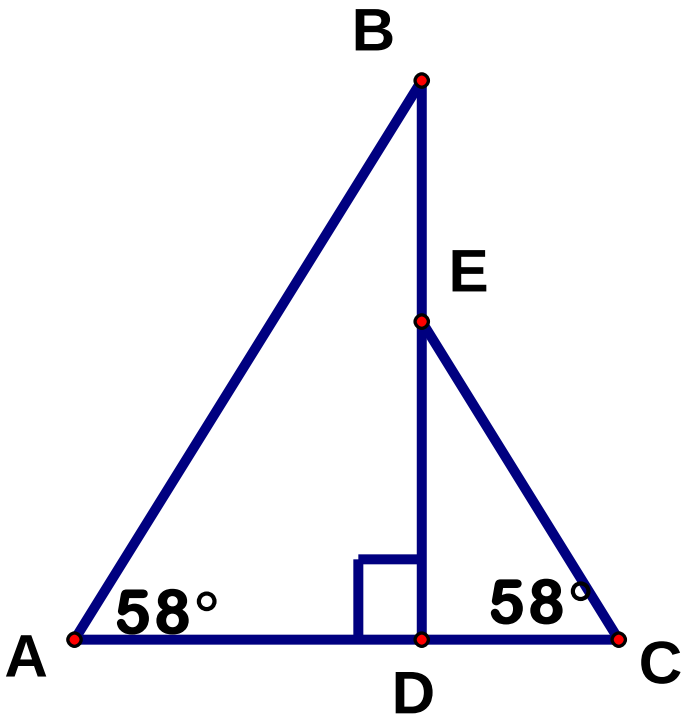
AA~

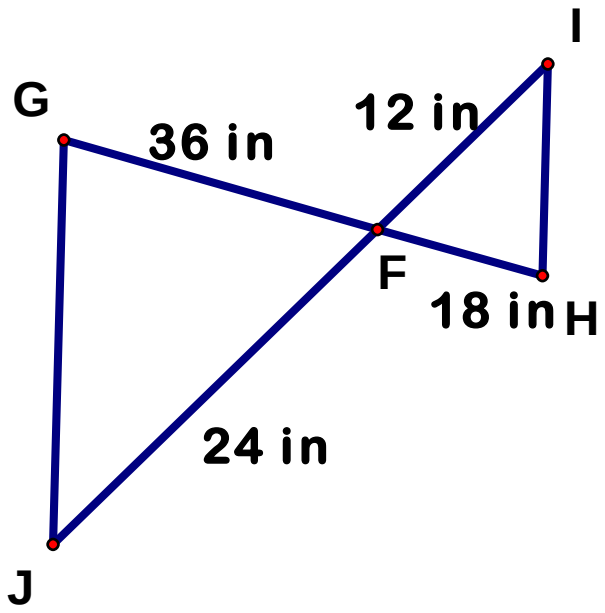


$$\frac{12}{24} = \frac{18}{35}$$

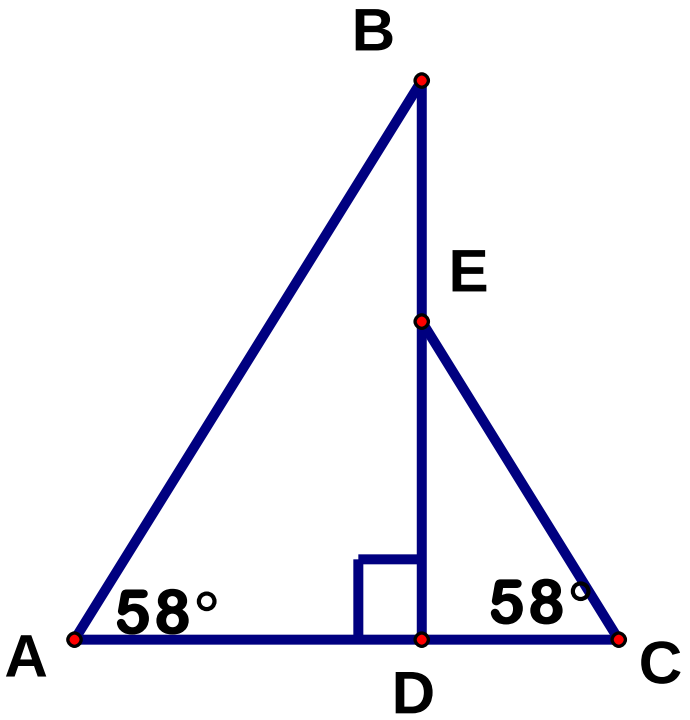
SAS~

Ex2:
Write a Similarity Statement

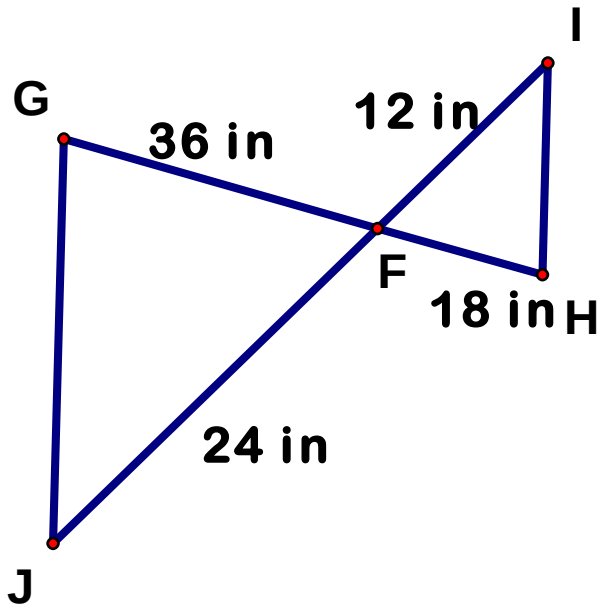




Ex2:
Write a Similarity Statement

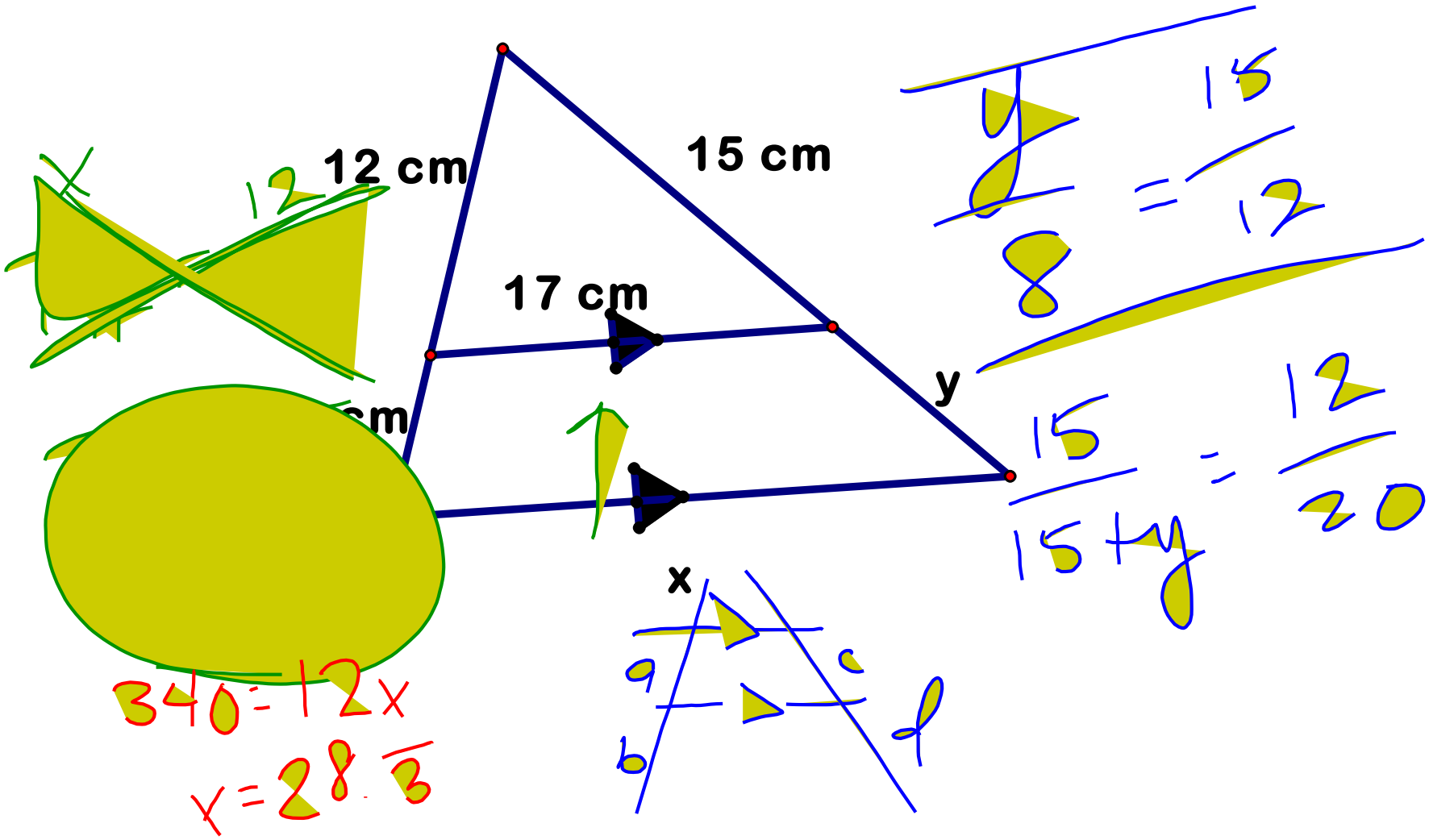


$\Delta ABD \sim \Delta CED$



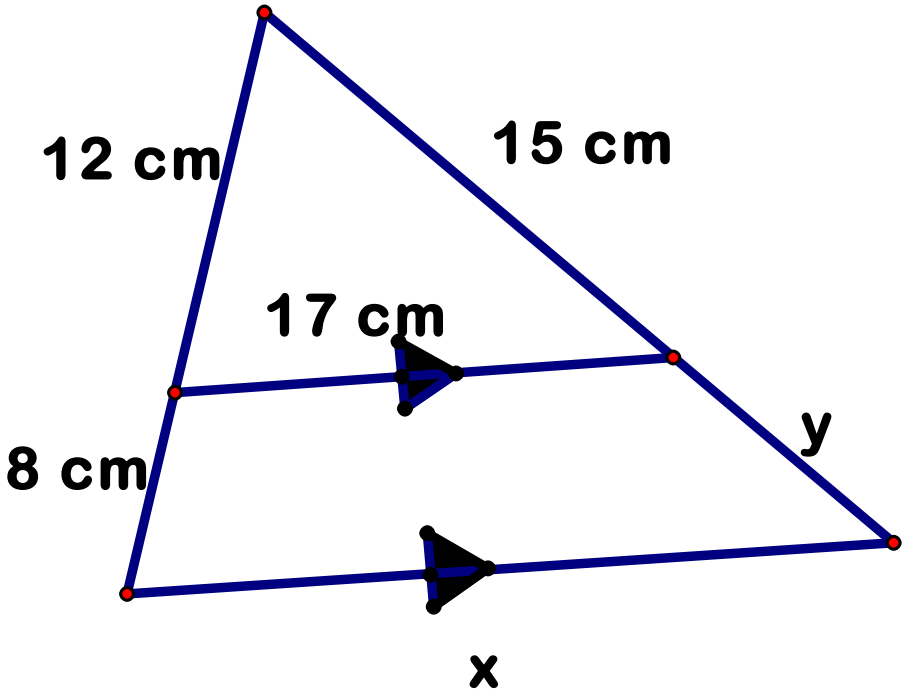
$\Delta JGF \sim \Delta IHF$

Ex 3: Explain why they are similar, find x, y



Ex 3: Explain why they are similar, find x, y

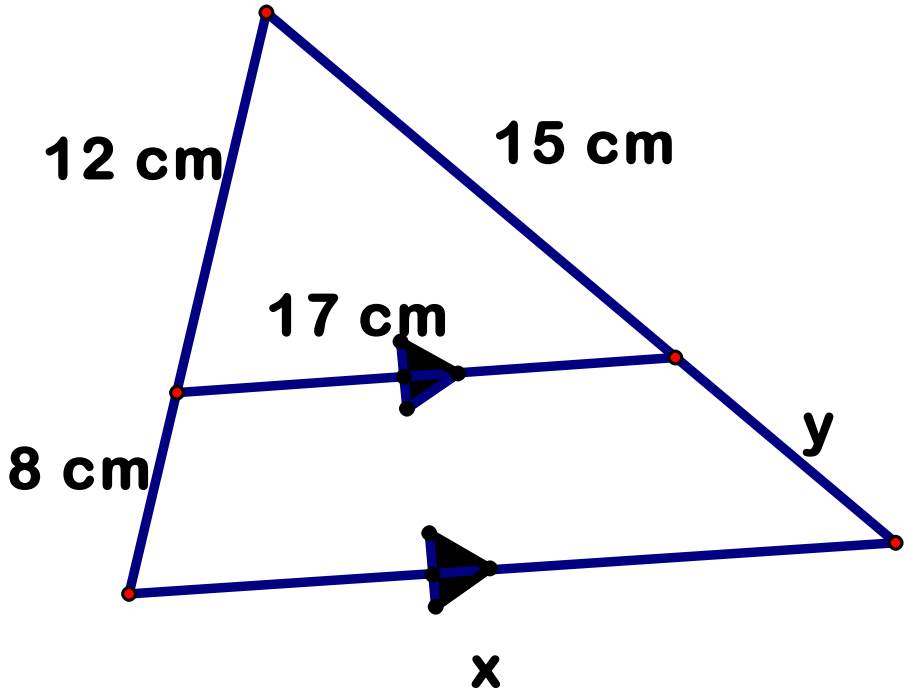
AA~



Ex 3: Explain why they are similar, find x, y

AA~

$$\frac{12}{20} = \frac{17}{x}$$

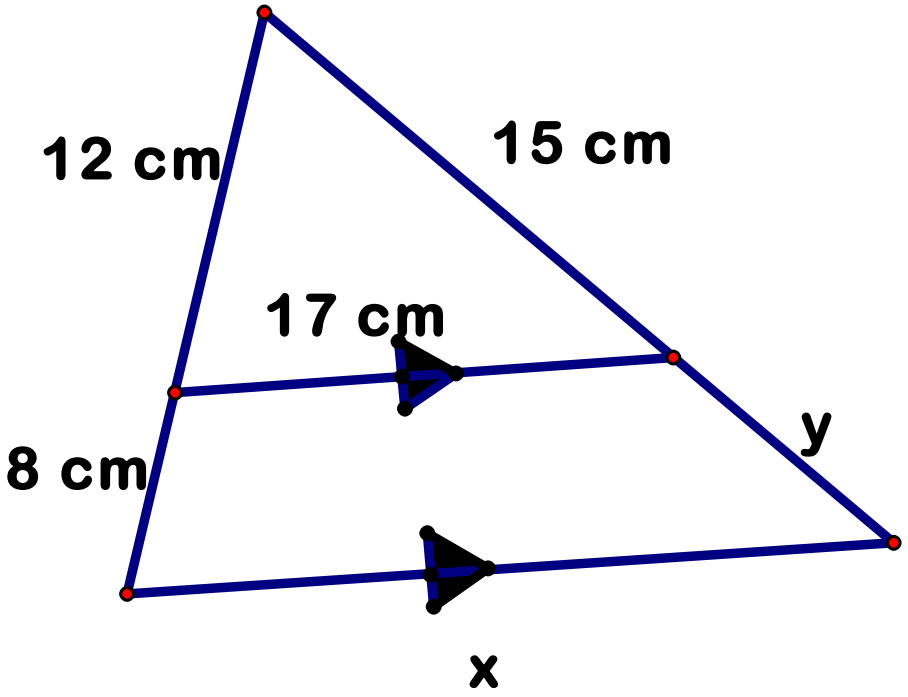


Ex 3: Explain why they are similar, find x, y

AA~

$$\frac{12}{20} = \frac{17}{x}$$

$$x = 28\frac{1}{3}$$

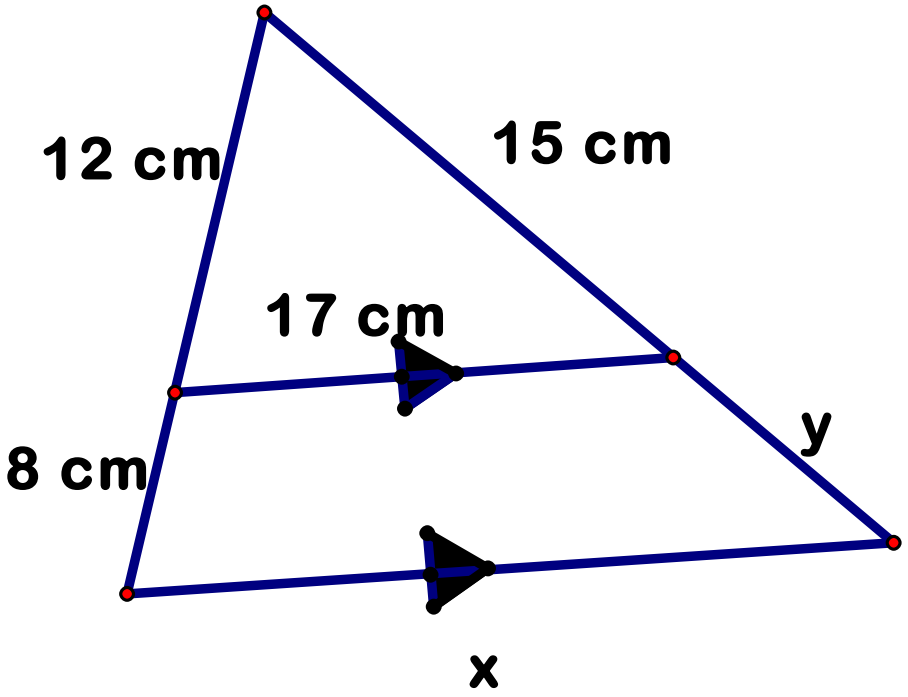


Ex 3: Explain why they are similar, find x, y

AA~

$$\frac{12}{20} = \frac{17}{x}$$

$$x = 28\frac{1}{3}$$



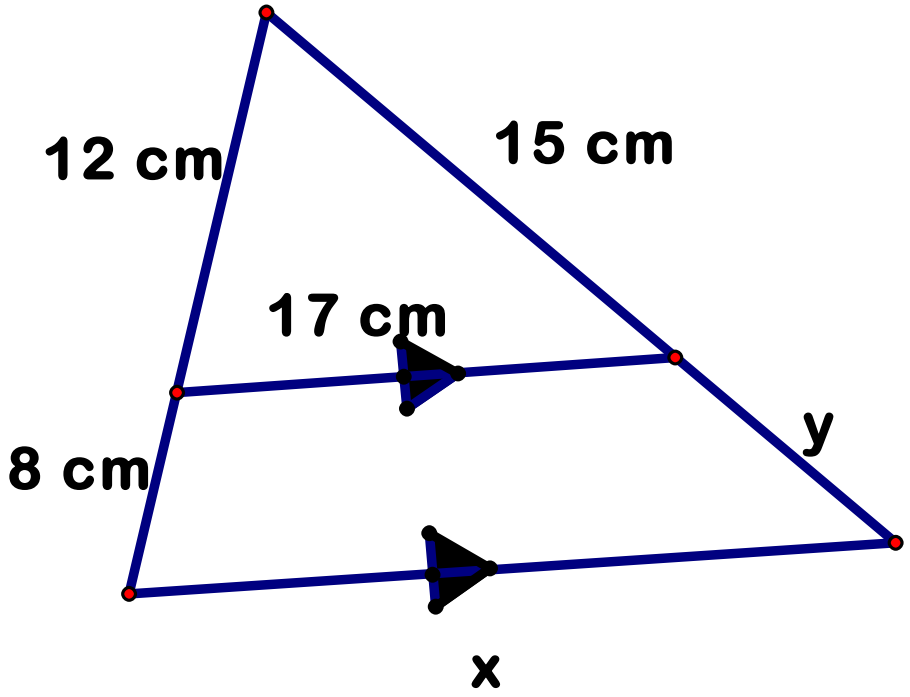
$$\frac{12}{20} = \frac{15}{s}$$

Ex 3: Explain why they are similar, find x, y

AA~

$$\frac{12}{20} = \frac{17}{x}$$

$$x = 28\frac{1}{3}$$



$$\frac{12}{20} = \frac{15}{s}$$

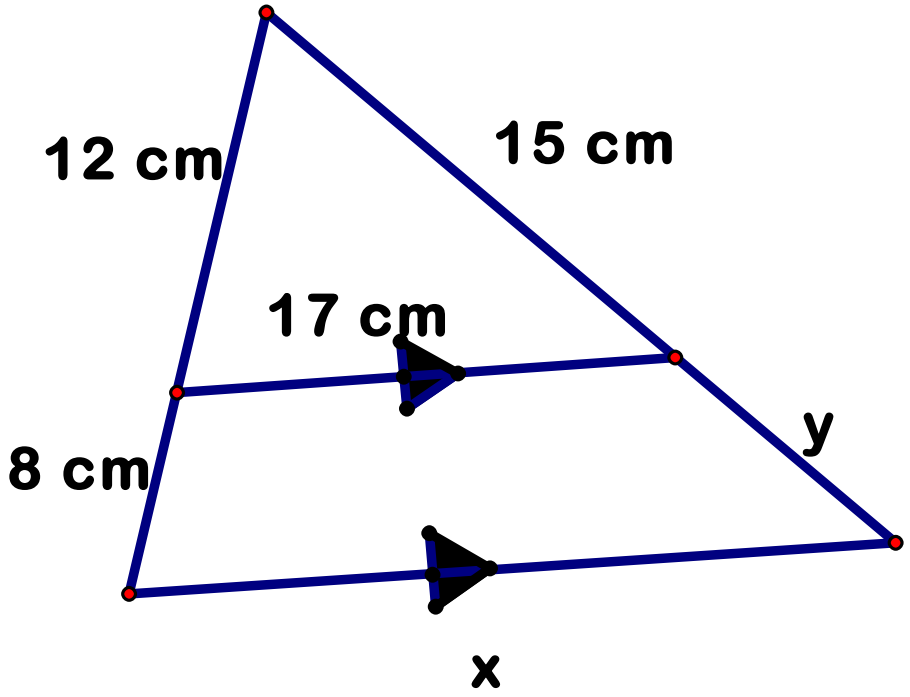
$$s = 25$$

Ex 3: Explain why they are similar, find x, y

AA~

$$\frac{12}{20} = \frac{17}{x}$$

$$x = 28\frac{1}{3}$$



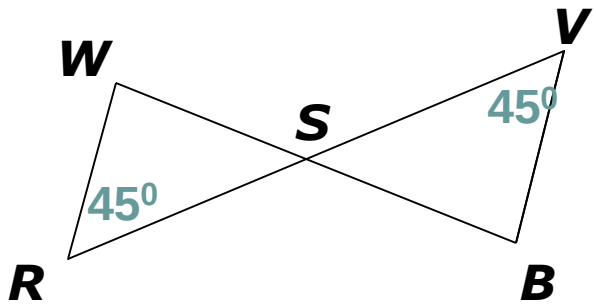
$$\frac{12}{20} = \frac{15}{s}$$

$$s = 25$$

$$y = 10$$

Ex 4: Using the Similarity Theorems

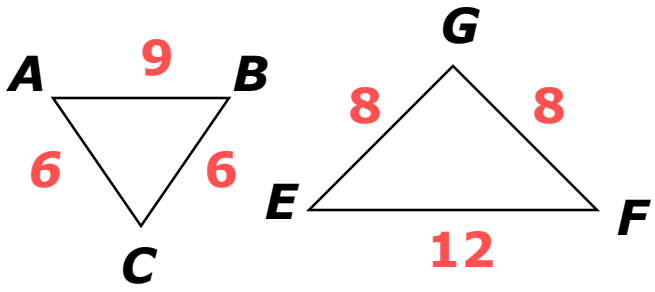
What theorem or postulate state that the two triangles similar?



1. $\angle R \cong \angle V$	1. Given
2. $\angle WSR \cong \angle VSB$	2. Vertical Angles
3. $\Delta RWS \sim \Delta VSB$	3. AA ~ Postulate

Ex 5: Using Similarity Theorems

- Write a similarity statement for the two triangles.



$$\frac{\text{Small Triangle}}{\text{Large Triangle}} = \frac{6}{8} = \frac{6}{8} = \frac{9}{12}$$

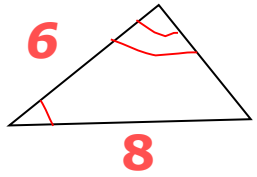
$$\frac{3}{4} = \frac{3}{4} = \frac{3}{4}$$

$\Delta ABC \sim \Delta EFG$ because all sides have a $3:4$ ratio.

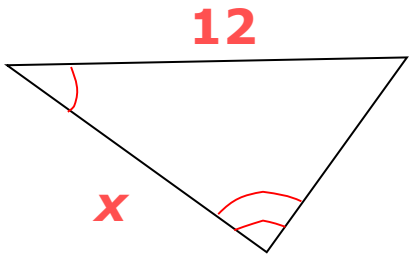
Ex 6: Finding Lengths in Similar Triangles

- Find the value of *x* in the figure.

$$\frac{\text{Small Triangle}}{\text{Large Triangle}} = \frac{6}{x} = \frac{8}{12}$$



$$\frac{6}{x} = \frac{8}{12}$$



$$6(12) = 8x$$

$$72 = 8x$$

$$\boxed{x = 9}$$

Stations

- Problems #1 – 12: State how the triangles are similar in the 1st box and then write the similarity statement in the 2nd box
- Problems #13 – 16: Write the proportion in the 1st box, solve for x, and write the solution in the 2nd box.
- Go to your assigned station, complete it, and then rotate to complete the others.

Homework

- p. 341 #1, 3 – 5, 7, 11, 12, 16, 19, 22