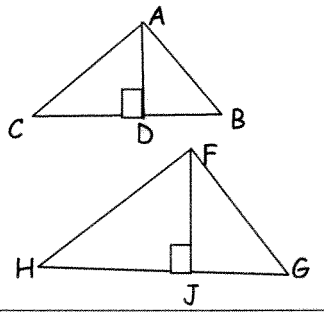
7-5 Parts of Similar Triangles

Name_____
Date_____ Block_____

Special Segments of Similar Triangles:

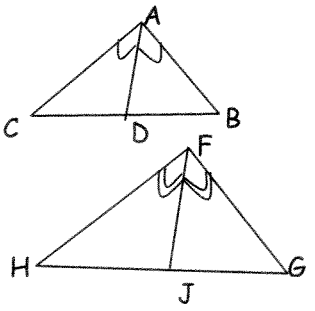
If 2 triangles are similar, the lengths of corresponding altitudes are proportional to the lengths of corresponding sides.

If $\Delta ABC \sim \Delta FGH$, then $\frac{AD}{FJ} = \frac{AB}{FG}$.



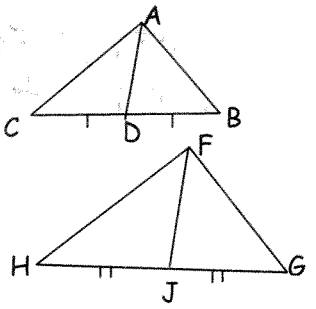
If two triangles are similar, the lengths of corresponding angle bisectors are proportional to the lengths of corresponding sides.

If $\Delta ABC \sim \Delta FGH$, then $\frac{AD}{FJ} = \frac{AC}{FH}$.



If two triangles are similar, the lengths of corresponding medians are proportional to the lengths of corresponding sides.

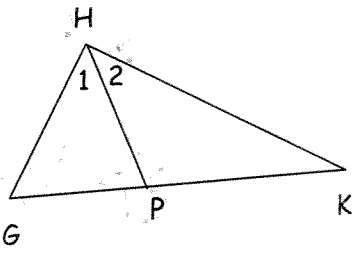
If $\Delta ABC \sim \Delta FGH$, then $\frac{AD}{FJ} = \frac{CB}{HG}$.



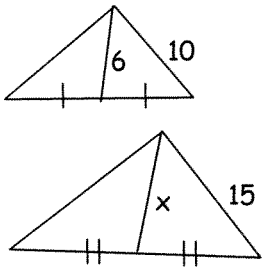
Triangle Angle Bisector Theorem:

An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other 2 sides of the triangle.

$\frac{HG}{GP} = \frac{HK}{PK}$ or $\frac{HG}{HK} = \frac{GP}{PK}$



Example 1: Given the 2 similar triangles, find x.

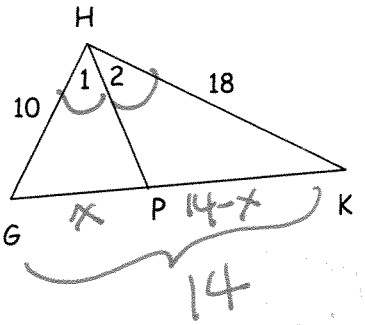


$\frac{6}{x} = \frac{10}{15}$

$10x = 6(15)$

$x = 9$

Example 2: $\angle 1 \cong \angle 2$ and GK = 14. Find GP.



$\frac{10}{x} = \frac{18}{14-x}$

$140 - 10x = 18x$

$140 = 28x$

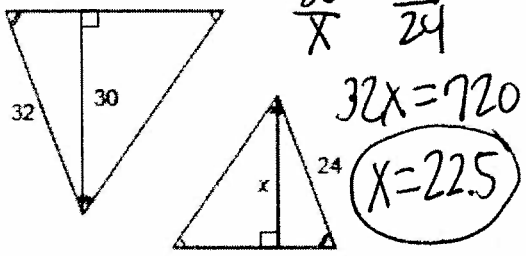
$x = 5$

NAME _____ DATE _____ PERIOD _____

7-5 Practice

Parts of Similar Triangles

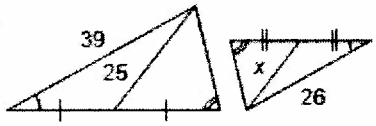
ALGEBRA Find x.

1. 

$\frac{30}{x} = \frac{32}{24}$

$32x = 720$

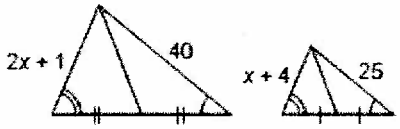
$x = 22.5$

2. 

$\frac{25}{x} = \frac{39}{26}$

$39x = 650$

$x \approx 16.7$

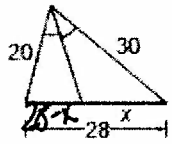
3. 

$\frac{2x+1}{x+4} = \frac{40}{25}$

$50x + 25 = 40x + 160$

$10x = 135$

$x = 13.5$

4. 

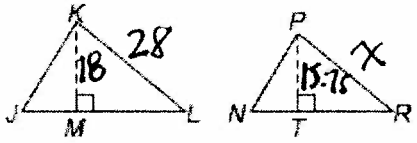
$\frac{20}{28-x} = \frac{30}{x}$

$20x = 840 - 30x$

$50x = 840$

$x = 16.8$

5. If $\triangle JKL \sim \triangle NPR$, is an altitude of $\triangle JKL$, $\overline{PT}$ is an altitude of $\triangle NPR$, $KL = 28$, $KM = 18$, and $PT = 15.75$, find PR.

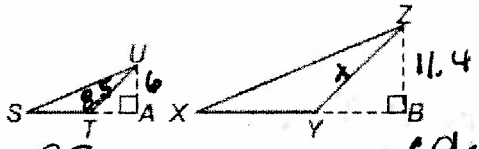


$\frac{18}{15.75} = \frac{28}{x}$

$18x = 441$

$x = 24.5$

6. If $\triangle STU \sim \triangle XYZ$, $\overline{UA}$ is an altitude of $\triangle STU$, $\overline{ZB}$ is an altitude of $\triangle XYZ$, $UT = 8.5$, $UA = 6$, and $ZB = 11.4$, find ZY.



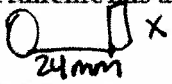
$\frac{8.5}{x} = \frac{6}{11.4}$

$6x = 96.9$

$x \approx 16.15$

$15x = 33600$

7. **PHOTOGRAPHY** Francine has a camera in which the distance from the lens to the film is 24 millimeters.



a. If Francine takes a full-length photograph of her friend from a distance of 3 meters and the height of her friend is 140 centimeters, what will be the height of the image on the film? (*Hint*: Convert to the same unit of measure.)

$\frac{24mm}{3m} = \frac{x}{140cm}$

$\frac{24mm}{3000mm} = \frac{x}{1400mm}$

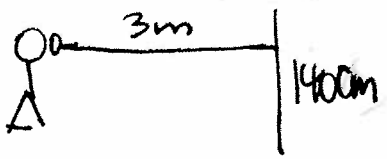
$3000x = 33600$

a. $x = 11.2$ mm

b. Suppose the height of the image on the film of her friend is 15 millimeters. If Francine took a full length shot, what was the distance between the camera and her friend?

10mm = 1cm

1000mm = 1m



$\frac{24mm}{15mm} = \frac{140cm}{x}$

$24x = 2100$

b. $x = 87.5$ cm