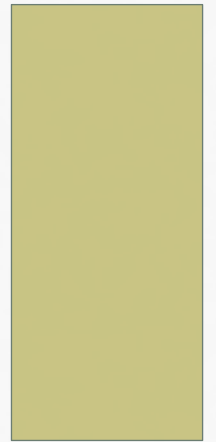
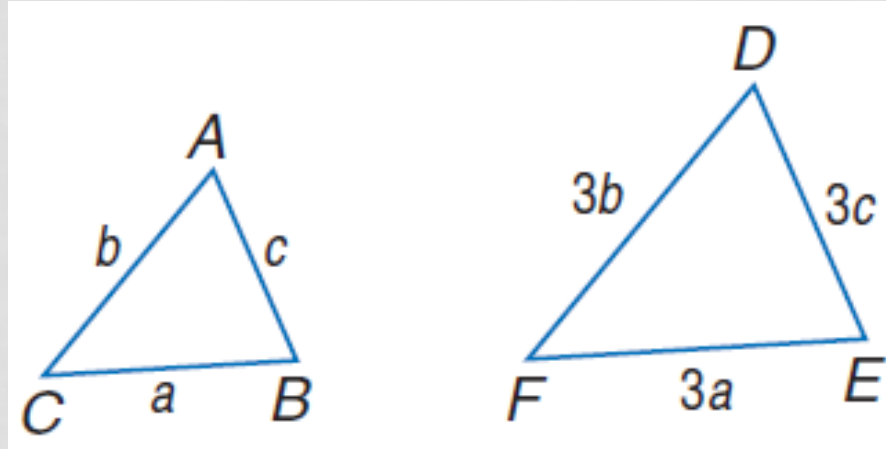


PARTS OF SIMILAR TRIANGLES



PROPORTIONAL PERIMETERS THEOREM

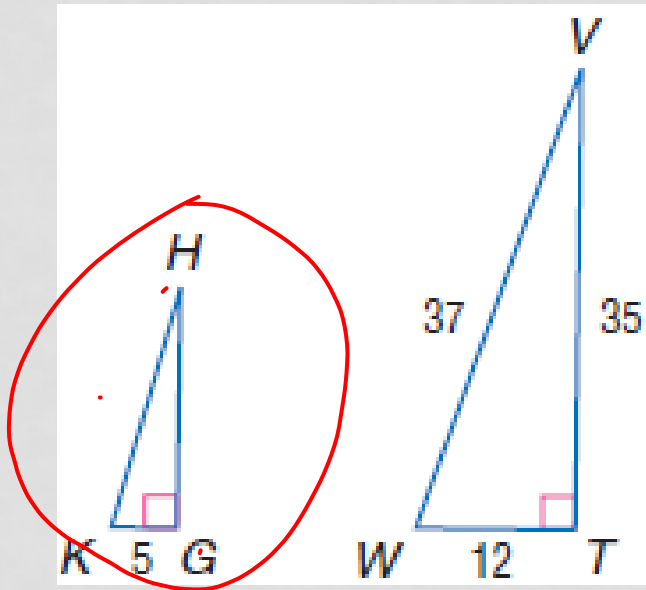
- If two triangles are similar, then the perimeters are proportional to the measure of corresponding sides.



$$\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{a + b + c}{3a + 3b + 3c} = \frac{1(a + b + c)}{3(a + b + c)} \text{ or } \frac{1}{3}$$

EXAMPLES

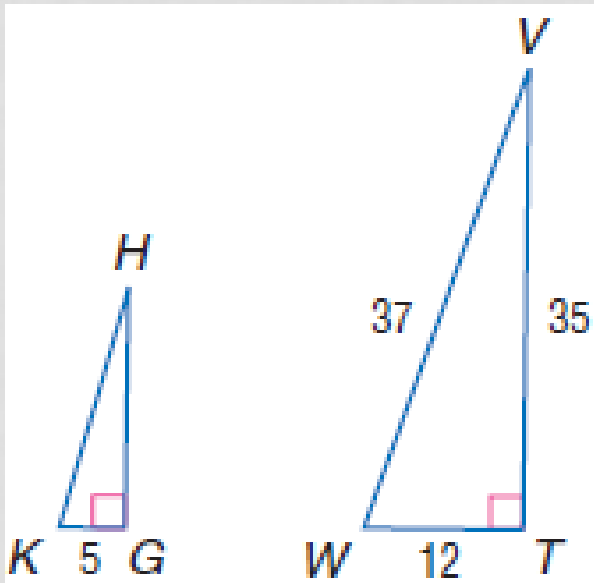
- If $\triangle GHK \sim \triangle TVW$, $TV = 35$, $VW = 37$, $WT = 12$, and $KG = 5$, find the perimeter of $\triangle GHK$.



$$\frac{5 \times 7}{12 \times 7} \neq \frac{X = 35}{84}$$

EXAMPLES

- If $\triangle GHK \sim \triangle TVW$, $TV = 35$, $VW = 37$, $WT = 12$, and $KG = 5$, find the perimeter of $\triangle GHK$.



The perimeter of $\triangle TVW = 35 + 37 + 12$ or 84.

$$\frac{5}{12} = \frac{x}{84}$$

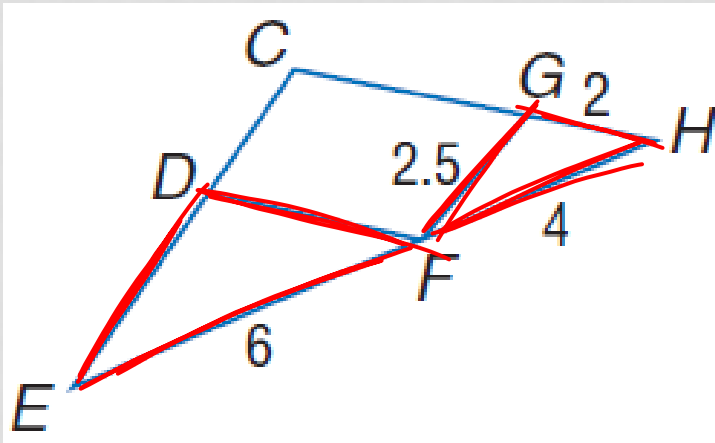
$$12x = 420$$

$$x = 35$$

The perimeter of $\triangle GHK$ is 35 units.

EXAMPLES

- If $\triangle DEF \sim \triangle GFH$, find the perimeter of $\triangle DEF$. = 12.75



$$\frac{6}{4} = \frac{x}{8.5}$$

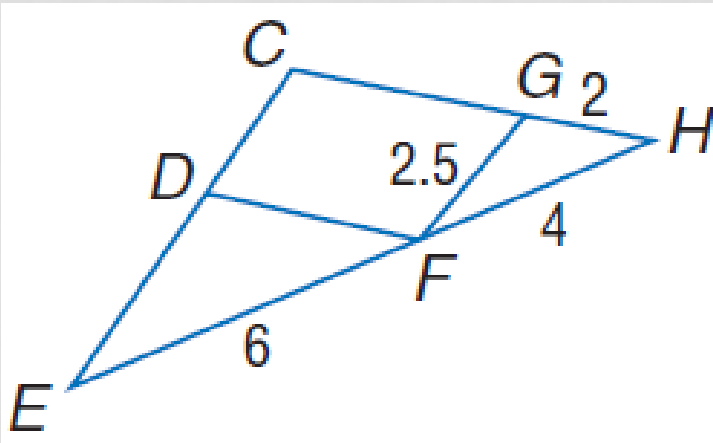
$$\frac{51}{4} = \frac{4x}{4}$$

$$12.75 = x$$

~~$$\frac{11.5}{51}$$~~

EXAMPLES

- If $\triangle DEF \sim \triangle GFH$, find the perimeter of $\triangle DEF$.



The perimeter of $\triangle GFH = 2 + 2.5 + 4 = 8.5$.

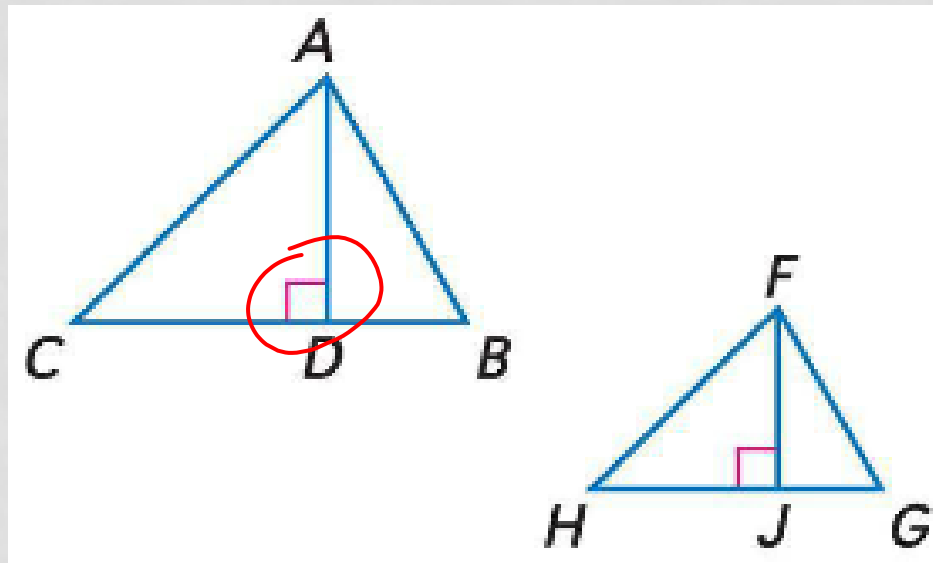
$$\frac{6}{4} = \frac{x}{8.5}$$

$$4x = 51$$

$$x = 12.75$$

ALTITUDES

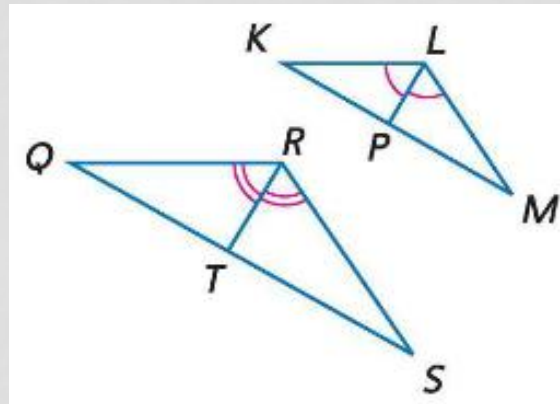
- If two triangles are similar, the lengths of corresponding altitudes are proportional to the lengths of the corresponding sides.



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

ANGLE BISECTORS

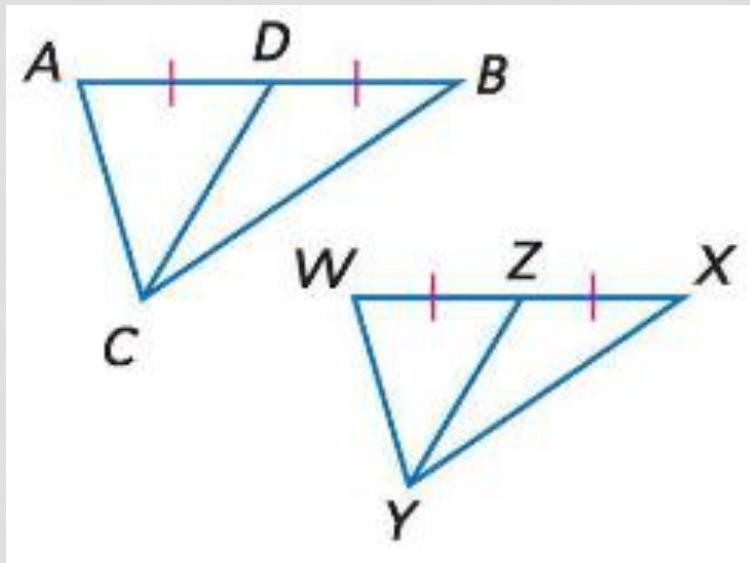
- If two triangles are similar, the lengths of corresponding angle bisectors are proportional to the lengths of the corresponding sides.



$$\text{If } \triangle KLM \sim \triangle QRS, \text{ then } \frac{LP}{RT} = \frac{LM}{RS}.$$

MEDIANS

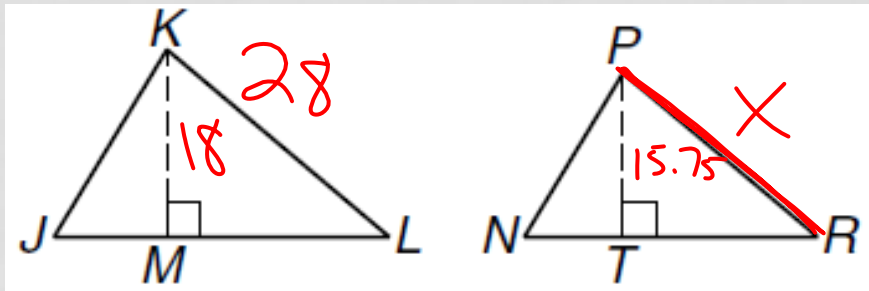
- If two triangles are similar, the lengths of corresponding medians are proportional to the lengths of the corresponding sides.



$$\text{If } \triangle ABC \sim \triangle WXY, \text{ then } \frac{CD}{YZ} = \frac{AB}{WX}.$$

EXAMPLES

- Use the given information to find each measure.
- Find PR if $\triangle JKL \sim \triangle NPR$, \overline{KM} is an altitude of $\triangle JKL$, \overline{PT} is an altitude of $\triangle NPR$, $KL = 28$, $KM = 18$, and $PT = 15.75$.



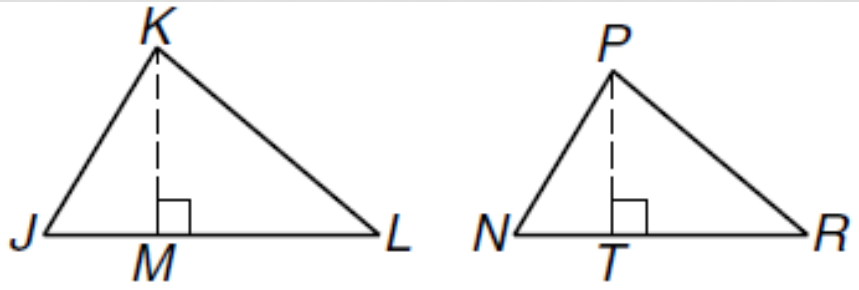
$$x = 24.5$$

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

~~$$24.5 = \frac{441}{18} = \frac{18x}{18}$$~~

EXAMPLES

- Use the given information to find each measure.
- Find PR if $\triangle JKL \sim \triangle NPR$, \overline{KM} is an altitude of $\triangle JKL$, \overline{PT} is an altitude of $\triangle NPR$, $KL = 28$, $KM = 18$, and $PT = 15.75$.



$$\frac{KM}{KL} = \frac{PT}{PR}$$

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

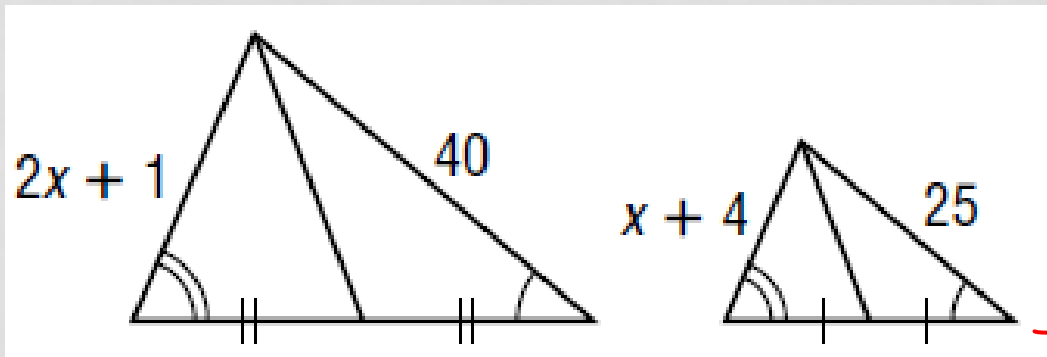
$$18x = 441$$

$$x = 24.5$$

EXAMPLES

$$x = 13.5$$
~~$$20$$~~

- Find x .



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

~~$$40x + 160 = 50x + 25$$

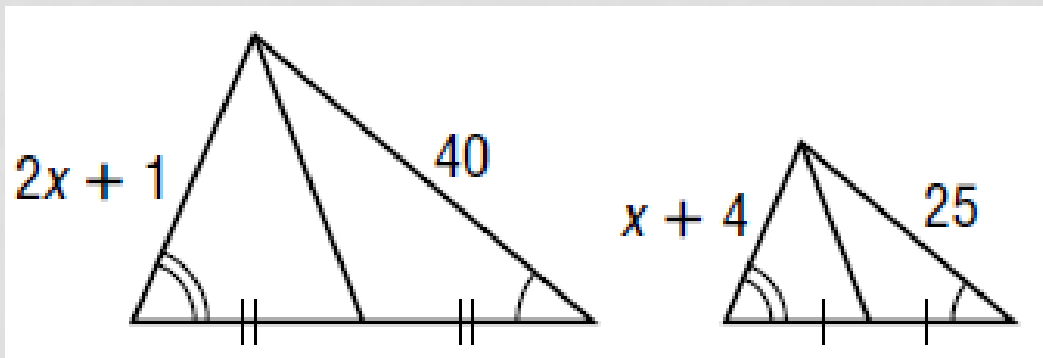
$$-40x \quad -25 \quad -40x \quad -25$$~~

$$\frac{135}{10} = \frac{10x}{10}$$

$$13.5 = x$$

EXAMPLES

- Find x .



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

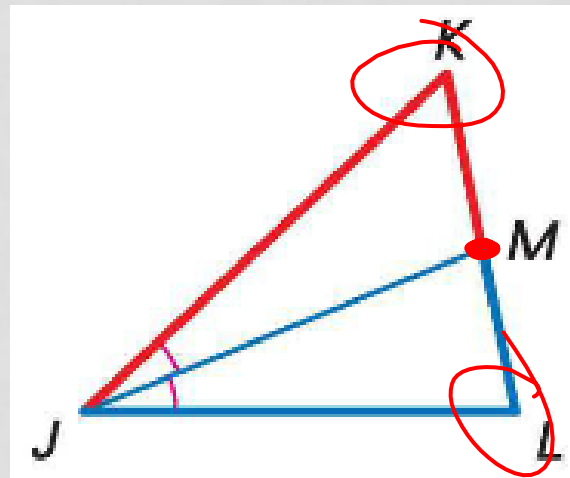
$$50x + 25 = 40x + 160$$

$$10x = 135$$

$$x = 13.5$$

TRIANGLE ANGLE BISECTOR

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



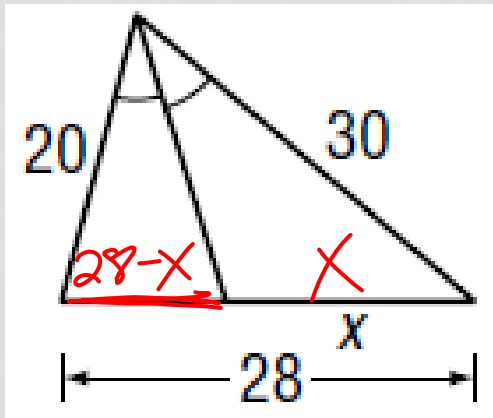
If \overline{JM} is an angle bisector of $\triangle JKL$,

$$\text{then } \frac{KM}{LM} = \frac{KJ}{LJ} \begin{array}{l} \leftarrow \text{segments with vertex } K \\ \leftarrow \text{segments with vertex } L \end{array}$$

EXAMPLES

$x =$

- Find x .



$$\frac{3}{2} = \frac{x}{28-x}$$

$$\begin{array}{r} 16.8 \\ \times 4 \\ \hline 23 \end{array}$$

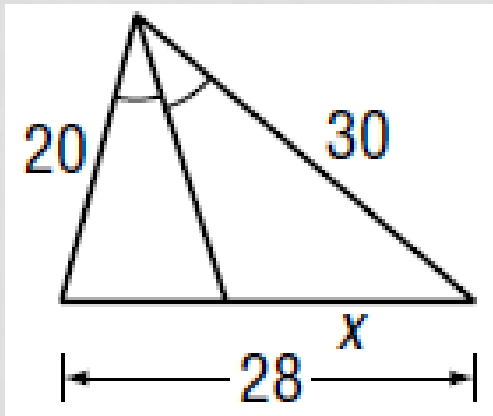
$$2x = 84 - \frac{3}{x}$$
$$+ 3x \quad \quad \quad + 3x$$

$$\frac{5x}{5} = \frac{84}{5}$$
$$\frac{5}{5} \quad \quad \quad \frac{5}{5}$$

$$x = 16.8$$

EXAMPLES

- Find x .



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

$$20x = 840 - 30x$$

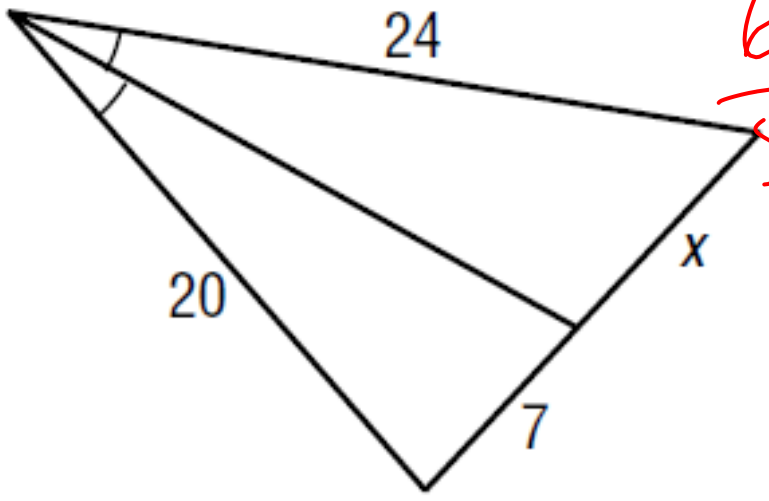
$$50x = 840$$

$$x = 16.8$$

EXAMPLES

$$X = 24$$
$$8.4$$
$$6.72$$

- Find x.



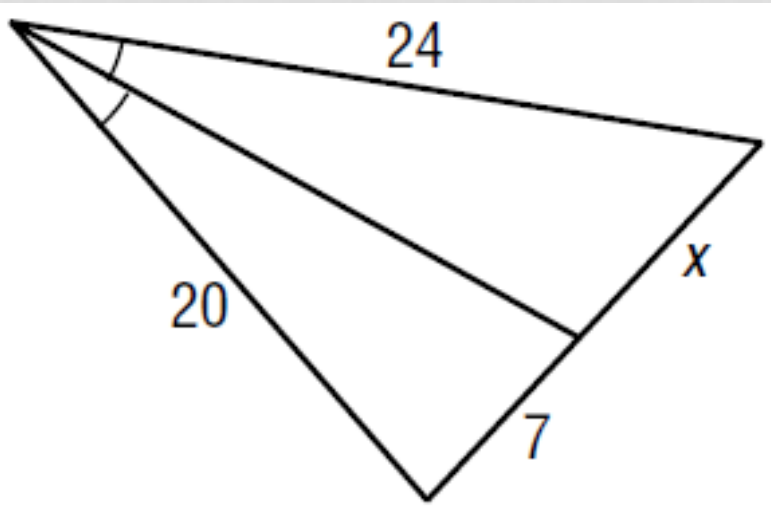
$$\frac{6 \cdot 24}{5 \cdot 20} = \frac{x}{7}$$

$$\frac{42}{5} = \frac{5x}{5}$$

$$\boxed{8.4 = x}$$

EXAMPLES

- Find x .



$$\frac{24}{x} = \frac{20}{7}$$

$$20x = 168$$

$$x = 8.4$$