Geometry CP

7.5 similar Parts of a △

Theorems

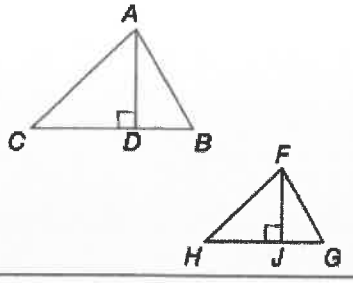
For Your FOLDABLE

Special Segments of Similar Triangles

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

Abbreviation ~△s *have corr. altitudes proportional to corr. sides.*

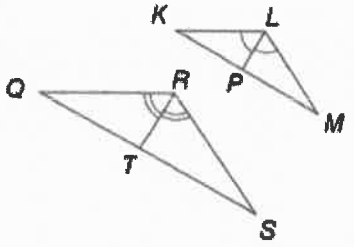
Example If $\triangle ABC \sim \triangle FGH$, then $\frac{AD}{FJ} = \frac{AB}{FG}$.



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

Abbreviation ~△s *have corr. ∠ bisectors proportional to corr. sides.*

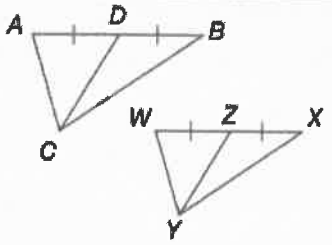
Example If $\triangle KLM \sim \triangle QRS$, then $\frac{LP}{RT} = \frac{LM}{RS}$.



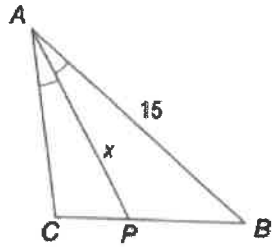
7.10 If two triangles are similar, the lengths of corresponding medians are proportional to the lengths of corresponding sides.

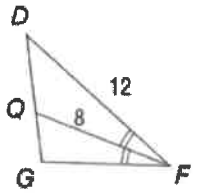
Abbreviation ~△s *have corr. medians proportional to corr. sides.*

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



1. In the figure $\triangle ABC \sim \triangle FDG$. Find the value of x.



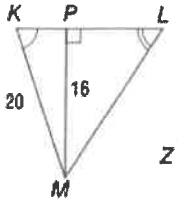


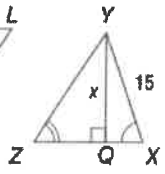
$\frac{AP}{FQ} = \frac{AB}{FD}$

$\frac{x}{8} = \frac{15}{12}$

$x = 10$

2. The triangles below are similar. Find the value of x.





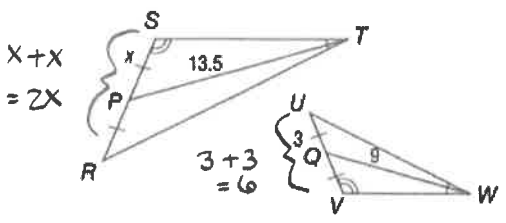
$\frac{MP}{YQ} = \frac{MK}{YX}$

$\frac{16}{x} = \frac{20}{15}$

$20x = 240$

$x = 12$

3. The triangles below are similar. Find the value of x.



$\frac{TP}{WQ} = \frac{SR}{UV}$

$\frac{13.5}{9} = \frac{2x}{6}$

$\frac{81}{9} = 2x$

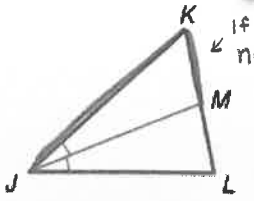
$9 = 2x$

$4.5 = x$

Theorem 7.11 **Triangle Angle Bisector** — For Your FOLDABLE

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

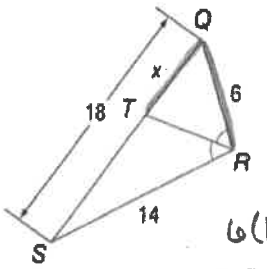
Example If $\overline{JM}$ is an angle bisector of $\triangle JKL$, then $\frac{KM}{LM} = \frac{KJ}{LJ}$ ← segments with vertex K / ← segments with vertex L



if in numerator ⇒ KJ needs to be in numerator of other ratio

4. Find x in the following diagrams:

a.



$\frac{QT}{TS} = \frac{QR}{SR}$

$\frac{x}{18-x} = \frac{6}{14}$

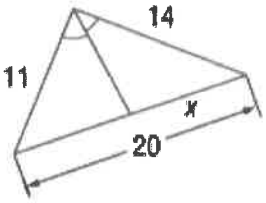
$6(18-x) = 14x$

$108 - 6x = 14x$

$108 = 20x$

$5.4 = x$

c.



$\frac{x}{20-x} = \frac{14}{11}$

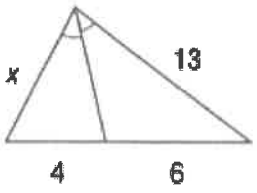
$11x = 14(20-x)$

$11x = 280 - 14x$

$25x = 280$

$x = 11.2$

b.

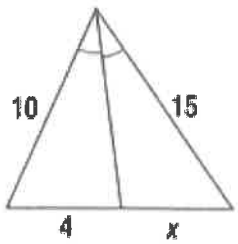


$\frac{4}{6} = \frac{x}{13}$

$\frac{52}{6} = x$

$\frac{26}{3} = 8.\overline{6} = x$

d.



$\frac{x}{4} = \frac{15}{10}$

$x = \frac{60}{10}$

$x = 6$