Name Key ACC Hour _____

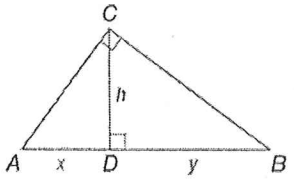
Similar Right Triangle NOTES

Theorems

For Your FOLDABLE

Right Triangle Geometric Mean Theorems

8.2 Geometric Mean (Altitude) Theorem The altitude drawn to the hypotenuse of a right triangle separates the hypotenuse into two segments. The length of this altitude is the geometric mean between the lengths of these two segments.



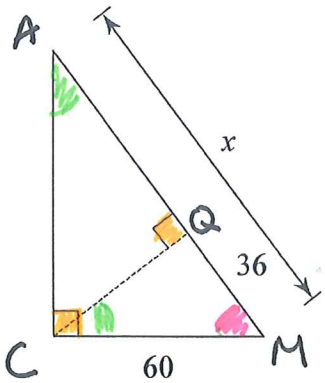
Example If $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$ of right $\triangle ABC$, then $\frac{x}{h} = \frac{h}{y}$ or $h = \sqrt{xy}$.

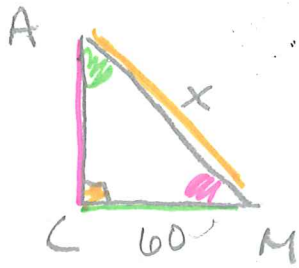
Review Vocabulary

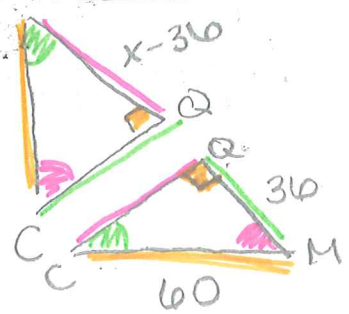
altitude (of a triangle) a segment from a vertex to the line containing the opposite side and perpendicular to the line containing that side (Lesson 5-2)

Example 1

$\triangle QMC \sim \triangle QCA \sim \triangle CMA$







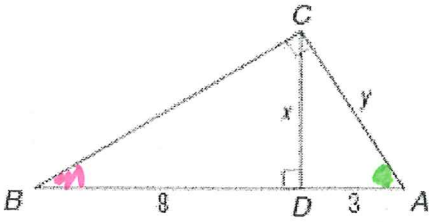
$\frac{AM}{CM} = \frac{CM}{QM}$

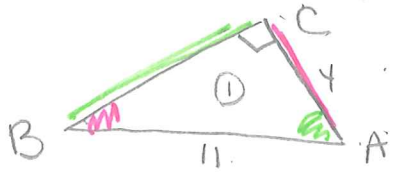
$\frac{x}{60} = \frac{60}{36}$

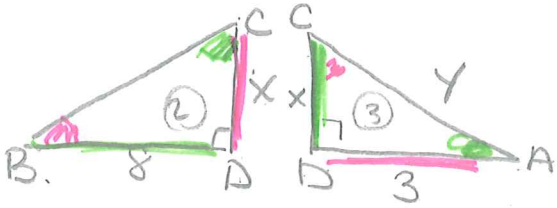
$x = 100$

Example 2

$\triangle CDB \sim \triangle ADC \sim \triangle ACB$







3 Find x switch

$\frac{CD}{AD} = \frac{BD}{CD}$

$\frac{x}{3} = \frac{8}{x}$

$x^2 = 24$

$x = \sqrt{24}$

$\sqrt{4}\ \sqrt{6}$

2

$x = 2\sqrt{6}$

Find y

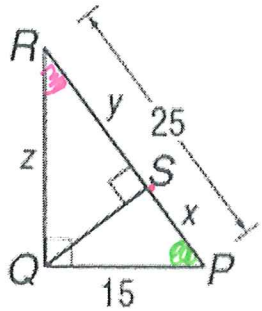
$\frac{CA}{AD} = \frac{AB}{CA}$

$\frac{y}{3} = \frac{11}{y}$

$y^2 = 33$

$y = \sqrt{33}$

Example 3 $\triangle QRS \sim \triangle PQS \sim \triangle PRQ$



Find x use 1+3

$\frac{SP}{QP} = \frac{QP}{RP}$

$\frac{x}{15} = \frac{15}{25}$

$\boxed{x = 9}$

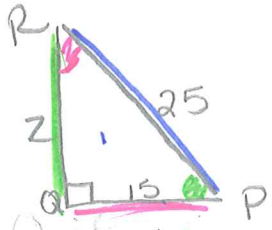
Find y

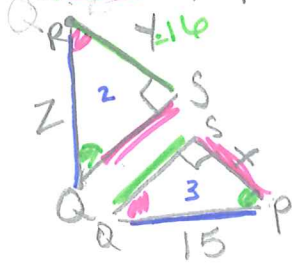
$25 = RP$

$RP = RS + SP$ segment addition

$25 = y + 9$

$\boxed{16 = y}$





Find Z 1+2

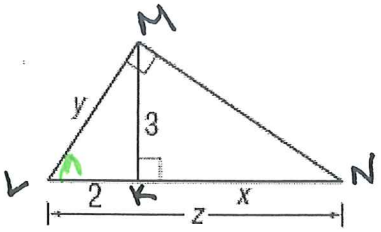
$\frac{RS}{RQ} = \frac{RQ}{RP}$

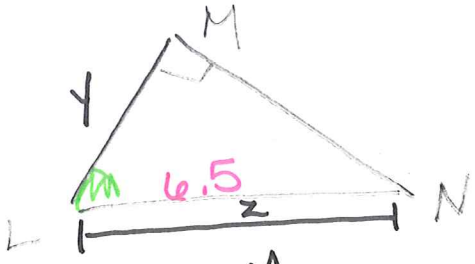
$\frac{16}{z} = \frac{z}{25}$

$z^2 = 400$

$\boxed{z = 20}$

Example 4 $\triangle LMN \sim \triangle LKM \sim \triangle MKN$

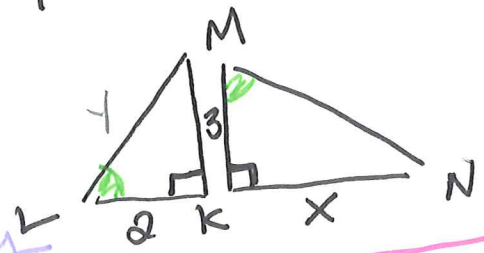




$\frac{LN}{LM} = \frac{LM}{LK}$

$\frac{6.5}{y} = \frac{y}{2}$

$\boxed{y = \sqrt{13}}$



Geometry

$\boxed{\frac{KN}{MK} = \frac{MK}{LK}}$ $\frac{x}{3} = \frac{3}{2}$ $\boxed{x = 4.5} \Rightarrow \boxed{z = 6.5}$

segment addition