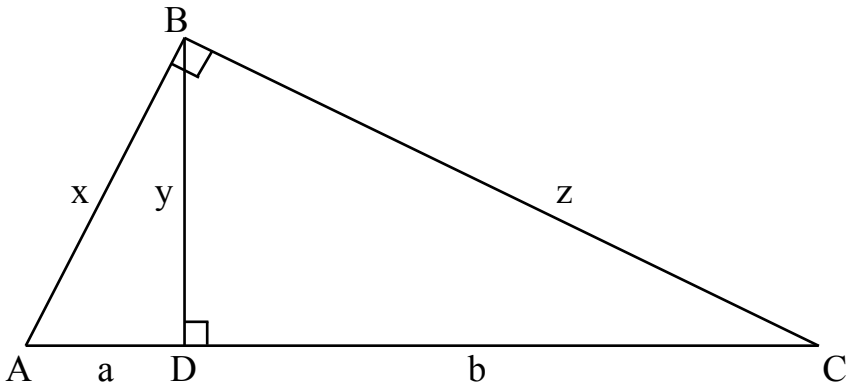
Teaching Notes for Geometry
Homework #7

Overview: In this lesson, students will learn about altitudes and medians of triangles.

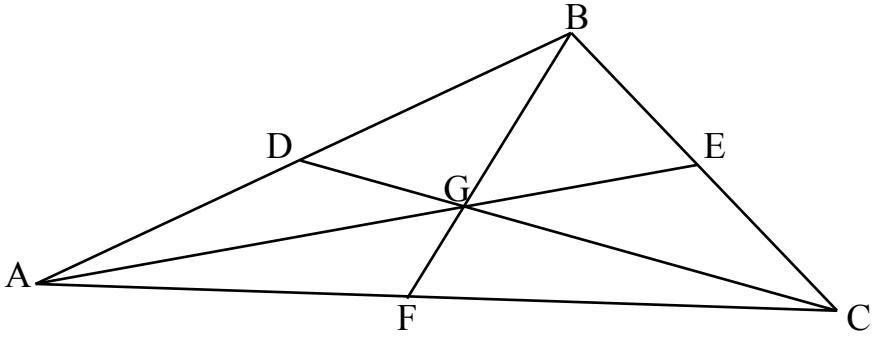
Preparation: Watch the videos “Altitudes of right triangles” and Medians of right triangle.”
Define altitude - The altitude of a triangle is a line from a vertex to the opposite side, that is perpendicular to that side. A triangle therefore has three possible altitudes. The altitude is the shortest distance from a vertex to its opposite side.
Define median and centroid -
The median of s triangle is a line from a vertex to the midpoint of the opposite side. A triangle has three medians, and they all cross over at a special point called the "centroid." The centroid is the location of the center of mass for any triangle.

Formulas for altitude in right triangles



$$\frac{y}{a}=\frac{b}{y},\frac{x}{a}=\frac{a+b}{x},\frac{z}{b}=\frac{a+b}{z}$$

Formulas for medians of triangles – I would not give these formulas as written below to the students. The “formulas” need to be given through example as outlined in the video.



$AD = DB, BE = EC, AF = FC$

$AG = 2GE, BG = 2FG, CG = 2DG$

$\Delta ADG = \Delta BDG = \Delta BGE = \Delta CEG = \Delta CFG = \Delta FGA$

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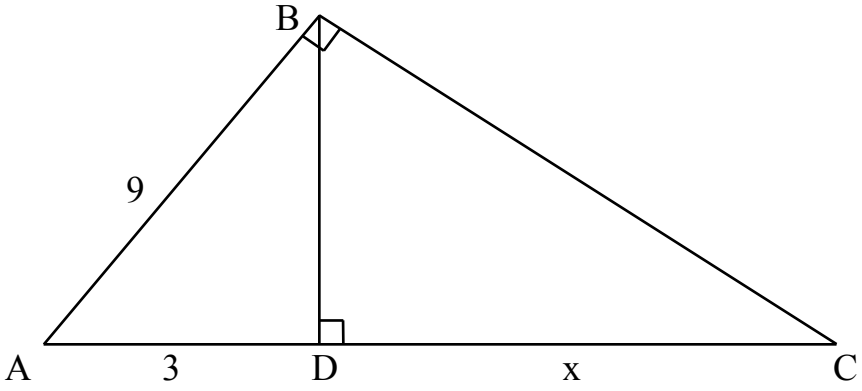
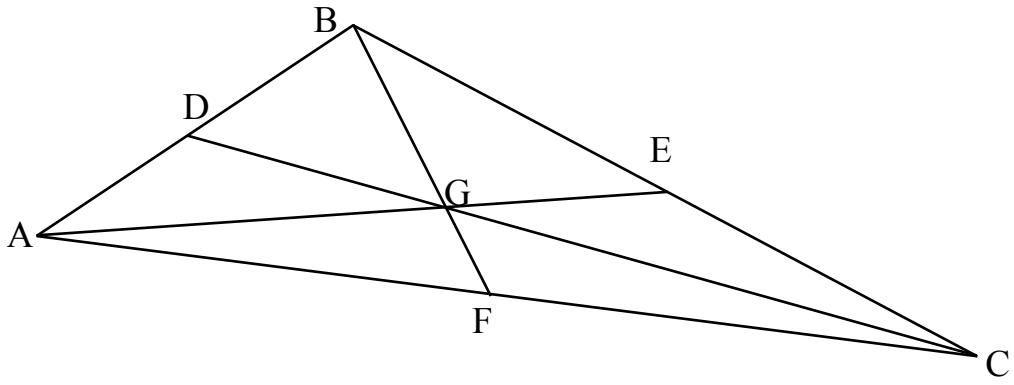
Classroom Examples:

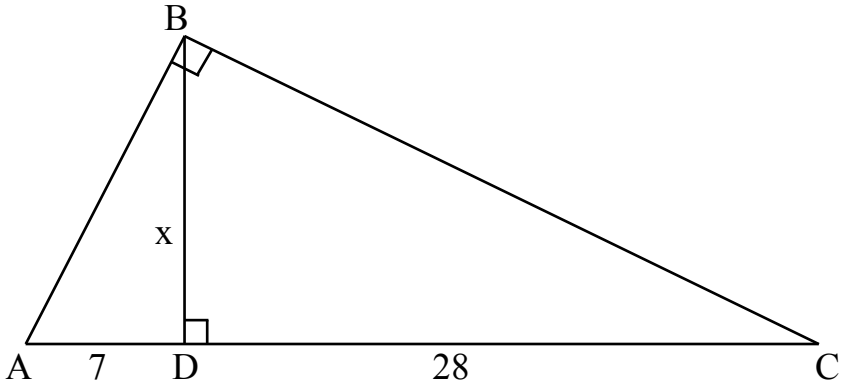
1) If BD is an altitude of right triangle ABC and AB = 9 while AD = 3, find x.



2) AE, BF, and CD are all medians of triangle ABC and they all intersect at point G. If the area of triangle AGD = 8, what is the area of quadrilateral FGEC? If BG = 22, what is the length of GF?



3) If BD is an altitude of right triangle ABC and AB = 28 while AD = 7, find x.



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4) AE, BF, and CD are all medians of triangle ABC and they all intersect at point G. If the area of triangle ABF = 18, what is the area of triangle DBC? If DC = 18, what is the length of GC?