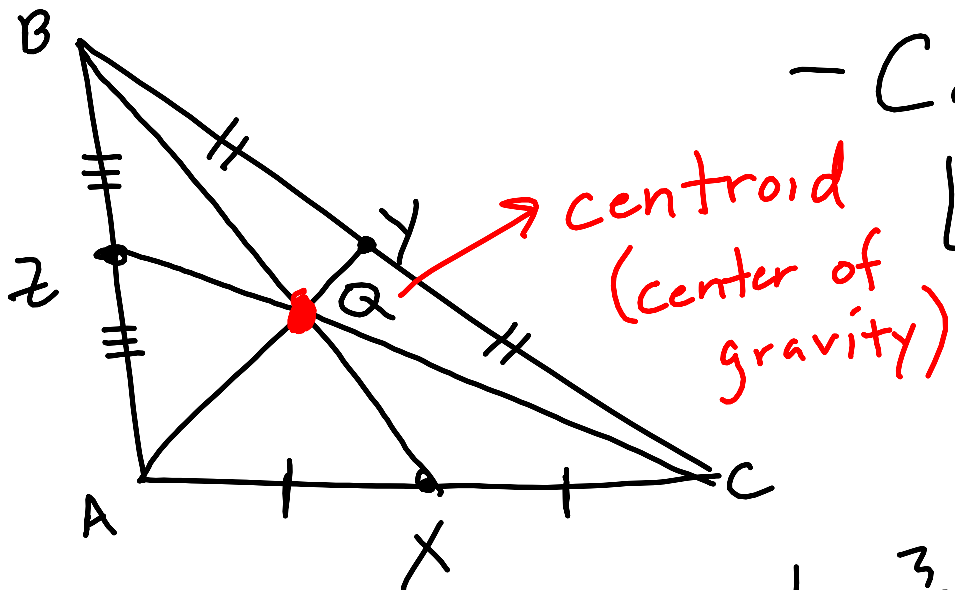
Medians / Altitudes

- median → vertex to midpoint of opposite side



- Concurrency of Medians Theorem
  - ↳ Medians are concurrent at a point $\frac{2}{3}$ of distance from each vertex to midpoint of opposite side

$AQ = \frac{2}{3} AY$ $\quad$ $CQ = \frac{2}{3} CZ$

$BQ = \frac{2}{3} BX$

$\frac{2}{3} + \frac{1}{3} = \frac{3}{3}$

EX → $QY = 10$
$AY = 10 + 20 = 30$
$AQ = 10 \cdot 2 = 20$

EX → $QZ = 12$
$QC = 12 \cdot 2 = 24$
$CZ = 12 + 24 = 36$

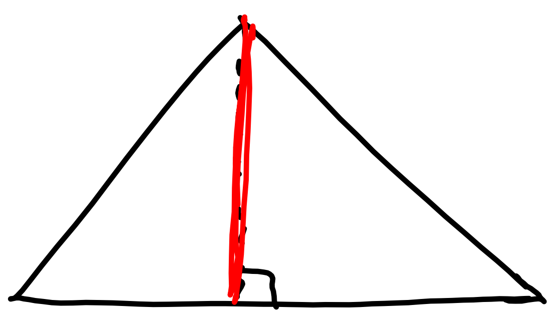
EX → $BQ = 12$
$QX = \frac{1}{2}(12) = 6$
$BX = 12 + 6 = 18$

EX → $AY = 15$
$AQ = \frac{2}{3}(15) = 10$
$QY = 5$

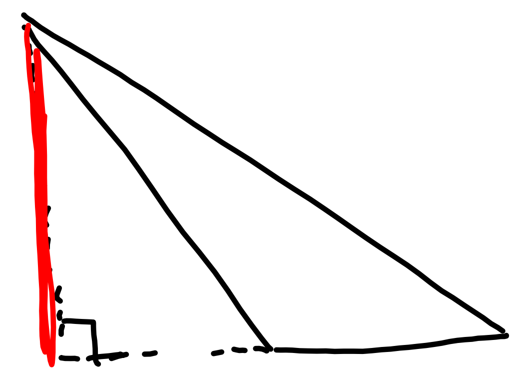
EX → $BX = 21$
$BQ = \frac{2}{3}(21) = 14$
$QX = 7$

EX → $CQ = 18$
$QZ = 9 = \frac{1}{2}(18)$
$CZ = 18 + 9 = 27$

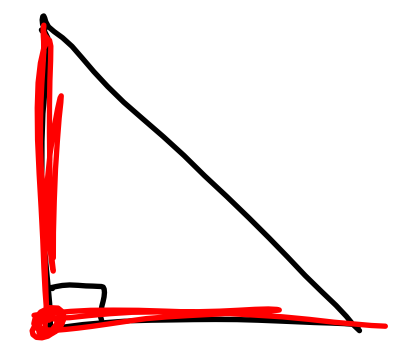
- Altitude → perpendicular segment from vertex to opposite side
- Concurrency of Altitudes Theorem
    - ↳ Altitudes are concurrent at a point named orthocenter and is concurrent inside (acute), outside (obtuse), or at the right angle of a triangle



acute



obtuse



right

HW: p. 312 → 8-13, 17-20, 24-27, 31, 40-42