5-1 day 2

Median:
* A segment whose endpoints are a vertex of a triangle and the midpoint of the side opposite the vertex.

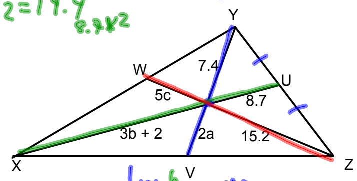
Centroid:
* The common point where the medians of a triangle all intersect.
* The point of balance for a triangle.

Centroid Theorem:
* The centroid of a triangle is located two-thirds of the distance from a vertex to the midpoint of the side opposite the vertex on a median.
* See Theorem 5.7 on page 240

2. Points U, V, and W are the midpoints of segments YZ, ZX, and XY, respectively. Find a, b, and c.

medians
centroid

$3b+2=17.4$ 8.7×2



a

$7.4 = \frac{2}{3}(2a+7.4)$ ×3

$22.2 = 2(2a+7.4)$

$22.2 = 4a + 14.8$

$-14.8 \quad -14.8$

$\frac{7.4}{4} = \frac{4a}{4}$

$\boxed{1.85 = a}$

b

$(3b+2) = \frac{2}{3}(3b+2+8.7)$ ×3

$9b+6 = 2(3b+10.7)$

$9b+6 = 6b+21.4$

$-6b \quad -6b$

$3b+6 = 21.4$

$-6 \quad -6$

$\frac{3b}{3} = \frac{15.4}{3}$

$\boxed{b = 5.1\overline{3}}$

c

$\frac{10c}{10} = \frac{15.2}{10}$

$c = 1.52$

or

$15.2 = \frac{2}{3}(5c+15.2)$ ×3

$45.6 = 2(5c+15.2)$

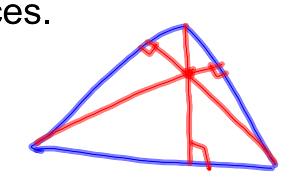
$45.6 = 10c + 30.4$

$15.2 = 10c$

$\boxed{1.52 = c}$

Altitude of a Triangle:

* A segment from a vertex of the triangle, to the side opposite it, and it must be perpendicular to the side.
* Every triangle has 3 altitudes, one from each of the vertices.



Orthocenter:

* The point of concurrency of the altitudes.

Types of lines	Concurrent at...	Special Feature
Perpendicular bisector	Circumcenter	circumcenter is equidistant from the vertices of the triangle.
angle bisector	incenter	incenter is equidistant from the sides of the triangle
median	centroid	Distance from vertex to the centroid is $\frac{2}{3}$ of the entire length of the median.
altitude	orthocenter	—