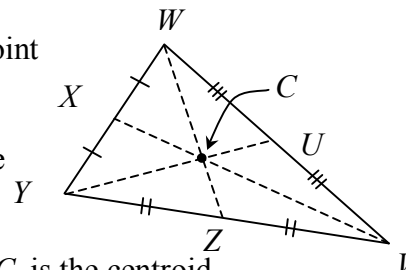


CENTROIDS

MEDIANS AND CENTROIDS

A line segment connecting a vertex of a triangle to the midpoint of the side opposite the vertex is called a **median**. Since a triangle has three vertices, it has three medians. The point at which the three medians intersect is called the **centroid**. The centroid is also the center of balance of a triangle.



In the diagram at right, \overline{WZ} , \overline{XV} , \overline{YU} are medians and point C is the centroid. The centroid is also located two thirds of the distance from each vertex to the midpoint of the opposite side: $CV = \frac{2}{3}XV$, $CW = \frac{2}{3}ZW$, $CY = \frac{2}{3}UY$.

Example

Use the figure above and the given information below to answer the following questions.

$$XY = 9, CY = 12, CX = 7$$

- Find the length of \overline{XW} .
- Find the length of \overline{YU} .
- Find the length of \overline{XV} .

Answers

Since X is midpoint, $XY = XW = 9$.

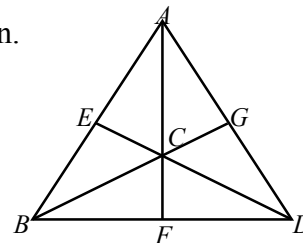
$$CY = \frac{2}{3}UY, 12 = \frac{2}{3}UY \Rightarrow UY = \frac{3}{2}(12) = 18$$

$$CX = \frac{1}{3}XV, 7 = \frac{1}{3}XV \Rightarrow XV = 3(7) = 21$$

Problems

Use the figure at right and the given information to answer each question. C represents the centroid of the triangle.

- If $BF = 9$, what is the length of \overline{DF} ?
- If $AC = 8$, what is the length of \overline{CF} ? Of \overline{AF} ?
- If $BG = 24$, what is the length of \overline{CG} ?
- If $BC = 9$ and $CG = 2x + 1$, solve for x .
- If $AC = y$ and $CF = 2.5$, solve for y .
- If $CD = 14.4$ and $EC = 8z$, solve for z .



Graph the triangle with vertices $A = (0, 6)$, $B = (4, 10)$, $C = (2, 2)$.

7. Find the coordinates of the midpoint of each segment.

8. Find the coordinates of the centroid of $\triangle ABC$.

Answers

1. 9

2. 4, 12

3. 8

4. 1.75

5. 5

6. 0.9

7. $(2, 8)$, $(3, 6)$, $(1, 4)$

8. $(2, 6)$