# Geometry

## Notes Section 5.4

### Use Medians and Altitudes

**VOCABULARY**

**Median of a triangle:** _____

_____

**Centroid:** _____

**Altitude of a triangle:** _____

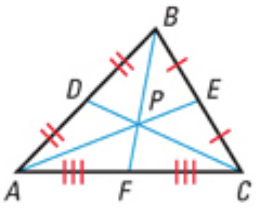
_____

**Orthocenter:** _____

**THEOREM 5.8 Concurrency of Medians of a Triangle**

The medians of a triangle intersect at a point that is two thirds of the distance from each vertex to the midpoint of the opposite side.

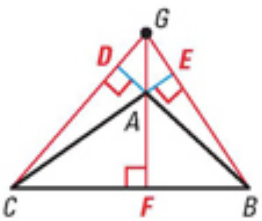
The medians of $\triangle ABC$ meet at $P$ and $AP = \frac{2}{3}AE$, $BP = \frac{2}{3}BF$, and $CP = \frac{2}{3}CD$.



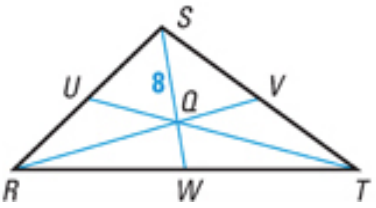

**THEOREM 5.9 Concurrency of Altitudes of a Triangle**

The lines containing the altitudes of a triangle are concurrent.

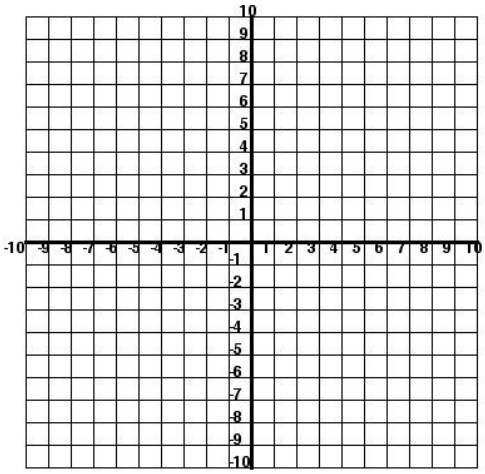
The lines containing $\overline{AF}$, $\overline{BE}$, and $\overline{CD}$ meet at $G$.



**EXAMPLE 1** In ΔRST, Q is the centroid and SQ = 8. Find QW and SW.

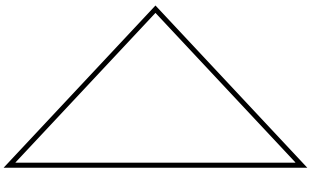



**EXAMPLE 2** The vertices of ΔFGH are F(2,5), G(4,9) and H(6,1). What are the coordinates of the centroid?

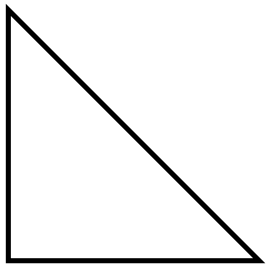


**EXAMPLE 3** Find the orthocenter P in an acute triangle, a right triangle and and obtuse triangle.

a) Acute



b) Right



c) Obtuse