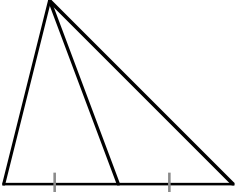
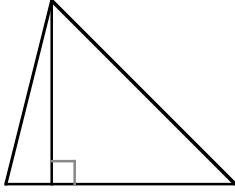
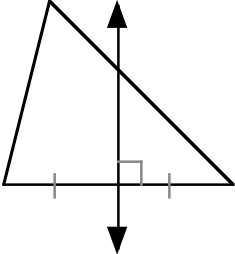
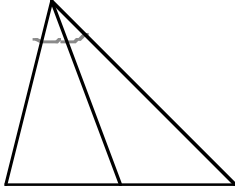


## Section 5.1 Special Segments in Triangles

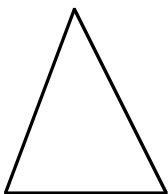
### Objective

To identify and use medians, altitudes, angle bisector, and perpendicular bisector in a triangle.

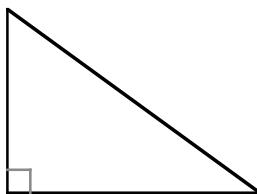
<p><b>Medians</b></p>  <p>A median is a segment that connects a vertex of a triangle to the midpoint of the side opposite that vertex.</p>	<p><b>Altitudes</b></p>  <p>An altitude has one endpoint at a vertex of a triangle and the other on the line that contains the side opposite that vertex so that the segment is perpendicular to this line.</p>
<p><b>Perpendicular Bisector</b></p>  <p>A line or line segment that passes through the midpoint of a side of a triangle and is perpendicular to that side is the perpendicular bisector of the side of the triangle.</p>	<p><b>Angle Bisector</b></p>  <p>An angle bisector of a triangle is a segment that bisects an angle of the triangle and has one endpoint at a vertex of the triangle and the other endpoint at another point on the triangle.</p>

Draw all three altitudes for each triangle.

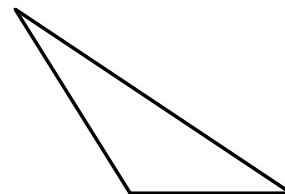
**Acute**



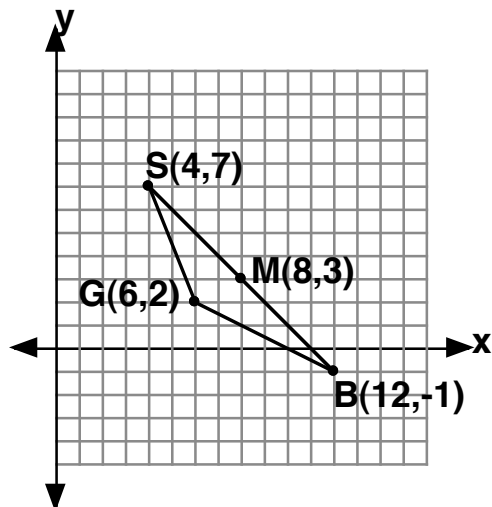
**Right**



**Obtuse**



$\triangle SGB$  has vertices  $S(4,7)$ ,  $G(6,2)$ , and  $B(12,-1)$



- Determine the coordinates of point J on  $\overline{GB}$  so that  $\overline{SJ}$  is a median of  $\triangle SGB$ .
- Point M has coordinates (8,3). Is  $\overline{GM}$  an altitude of  $\triangle SGB$ ?

### Theorems

Any point on the perpendicular bisector of a segment is equidistant from the endpoints of the segment.

Any point equidistant from the endpoints of a segment lies on the perpendicular bisector of the segment.

Any point on the bisector of an angle is equidistant from the sides of the angle.

An point on or in the interior of an angle and equidistant from the sides of an angle lies on the bisector of the angle.