

GeoGebra Activity

Name _____

* Log on to GeoGebra *
* Save before you exit! *
GeoGebra does NOT automatically save

A. Investigating the *circumcenter*.

- 1) Open up a new GeoGebra file and draw and label a triangle.
- 2) Construct the perpendicular bisector for *each* of the sides.

 Perpendicular Bisector Select two vertices, ...

- 3) Construct the point of intersection of the $\perp$ bisectors.

 Intersect Select two of the $\perp$ lines

The intersection of the $\perp$ bisectors of a triangle is the **circumcenter**.

- 4) Move the vertices of the triangle and note the location of the circumcenter.

Acute triangle: circumcenter is _____ the triangle
inside, outside, on

Right triangle: circumcenter is _____ the triangle
inside, outside, on

Obtuse triangle: circumcenter is _____ the triangle
inside, outside, on

- 5) Construct the **circumcircle**.

 Circle with Center through Point Select circumcenter and one of the vertices

- 6) Move the vertices of the triangle and make a conjecture regarding the circumcircle.

B. Investigating the *incenter*.

- 1) Draw and label a new triangle. (May use same file or open up a new file)
- 2) Construct the angle bisector for *each* of the angles.

 Angle Bisector Select three points with the vertex the middle point, ...

- 3) Construct the point of intersection of the angle bisectors.

 Intersect Select two of the angle bisectors

The intersection of the angle bisectors of a triangle is the **incenter**.

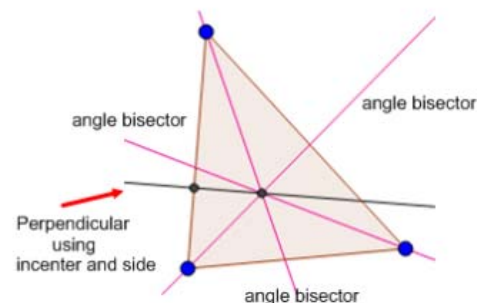
- 4) Move the vertices of the triangle and note the location of the incenter.

Acute triangle:

Right triangle:

Obtuse triangle:

The **incenter** of a triangle is equidistant from the sides of the triangle. This can be seen by constructing a circle using the incenter as the center of the circle.



5) Construct the **incircle**.

- Construct a perpendicular line using the incenter and one of the sides of the $\triangle$.



Perpendicular Line Select incenter and a side of triangle

6) Construct the point of intersection of the $\perp$ line and the side of the triangle.



Intersect Select the $\perp$ line and the side of the triangle it intersects.

- Construct a circle using the incenter as the center



Circle with Center through Point Select incenter and the $\perp$ intersection point

7) Move the vertices of the triangle and make a conjecture regarding the incircle.

C. Investigating the **centroid** of a triangle.

1) Open up a new GeoGebra file and draw and label a triangle.

2) Construct the midpoint for *each* of the sides.



Midpoint or Center Select two vertices, ...

3) Construct the medians (segment connecting vertex to midpoint of opposite side).



Segment Select vertex, midpoint opposite side, ...

4) Construct the intersection of the medians.



Intersect Select two of the medians

The intersection of the medians of a triangle is the **centroid.**

5) Move the vertices of the triangle and note the location of the centroid.

Acute triangle:

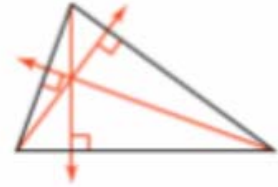
Right triangle:

Obtuse triangle:

6) Move the vertices of the triangle and make a conjecture regarding the centroid.

D. Investigating the *orthocenter* of a triangle.

- 1) Draw and label a new triangle. (May use same file or open up a new file)
- 2) Construct the altitudes (segment connecting vertex and opposite side forming a $\perp$ segment).



 Perpendicular Line Select vertex and opposite side, ...

- 3) Construct the intersection of the altitudes.

 Intersect Select two of the altitudes

The intersection of the altitudes of a triangle is the **orthocenter**.

- 4) Move the vertices of the triangle and note the location of the orthocenter.

Acute triangle:

Right triangle:

Obtuse triangle:

- 5) Move the vertices of the triangle and make a conjecture regarding the orthocenter.

All the points of concurrency:

Circumcenter

Incenter

Centroid

Orthocenter

