**PERPENDICULAR BISECTORS**

Step 1: Using your point tool, draw 3 points and label them A, B, and C.

Step 2: Create triangle ABC, by constructing the three segments. (Select all three points and select “Segments” under the “Construct” menu.)

Step 3: Construct the perpendicular bisectors of each side of the triangle. To do this, construct the midpoints of , , and . Label these points D, E, and F respectively. (Construct the midpoints by selecting the segments, and then choosing “Midpoint” under the “Construct” menu.)

Step 4: Construct a line through point D so that it is perpendicular to . (Construct the perpendicular line by selecting point D and , and then choosing “Perpendicular Line” under the “Construct” menu.)

Step 5: Construct a line through point E so that it is perpendicular to.

Step 6: Construct a line through point F so that it is perpendicular to . Label the point of intersection of all three lines R.

Step 7: Select point R and point B, in that order. Under the “Construct” menu select “Circle by Center+Point”. What do you notice?

Step 8: Drag points A, B, and C around to change the size and shape of your triangle. Observe the location of point R as your triangle changes from acute to right to obtuse.

**ALTITUDES**

Step 1: Using your point tool, draw 3 points and label them A, B, and C.

Step 2: Create triangle ABC, by constructing the three segments. (Select all three points and select “Segments” under the “Construct” menu.)

Step 3: Construct the three altitudes of the triangle. Select point A and  and select “perpendicular line” under the “Construct” menu. Repeat this process for point B and , and point C and . Label your point of intersection as O.

Step 4: Drag points A, B, and C around to change the size and shape of your triangle. Observe the location of point O as your triangle changes from acute to right to obtuse.

**MEDIANS**

Step 1: Using your point tool, draw 3 points and label them A, B, and C.

Step 2: Create triangle ABC, by constructing the three segments. (Select all three points and select “Segments” under the “Construct” menu.)

Step 3: Construct the midpoints of , , and . Label these points D, E, and F respectively. (Construct the midpoints by selecting the segments, and then choosing “Midpoint” under the “Construct” menu.)

Step 4: Draw the medians of triangle ABC by connecting points A and E, B and F, and C and D. Label their point of intersection as M.

Step 5: Under the measure menu, measure the length (or distance) of the following segments and examine their relationship (select the two endpoints of the segment you want to measure and choose “Distance” under the “Measure” menu):

1. BM, MF, and BF
2. AM, ME, and AE
3. CM, MD, and CD

Step 6: Drag points A, B, and C around to change the size and shape of your triangle. Observe the location of point M as your triangle changes from acute to right to obtuse.

**ANGLE BISECTORS**

Step 1: Using your point tool, draw 3 points and label them A, B, and C.

Step 2: Create triangle ABC by constructing the three segments. (Select all three points and select “Segments” under the “Construct” menu.)

Step 3: Construct the angle bisector of and . (Select the points in order of the angle you want to bisect. Then, under the “Construct” menu, select “Angle bisector.) Label the point of intersection S.

Step 4: Drag points A, B, and C around to change the size and shape of your triangle. Observe the location of point S as your triangle changes from acute to right to obtuse.

Step 5: Construct a line through point S so that it is perpendicular to . (Select point S and , then select “Perpendicular line” under the “Construct” menu.)

Step 6: Label the point of intersection of the perpendicular line as X.

Step 7: Select point S and point X. Under the “Construct” menu select “Circle by Center+Point”. Drag points A, B, and C around to change the size and shape of your triangle. What do you notice?