

Point of Concurrency and (more) Circumcircle

Problem #1:

This first problem is taken from NCTM's [Illumination project](#). An interactive version of the exploration could be found [here](#).

Use the following steps on GSP to construct a circumcircle:

1. Construct the [perpendicular bisector](#) of each side of the triangle.
2. Label the intersection of the bisectors point O . This point is the circumcenter of the triangle. (Note that all three perpendicular bisectors meet at the same point; therefore, it would have been sufficient to only construct two of the perpendicular bisectors in Step 1 to identify the circumcenter.)
3. Using O as the center, construct a circle that passes through the vertices of the triangle.

Point M is the midpoint of AB , and O is the circumcenter of triangle ABC . The circumcircle with center O and radii OA and OB has been constructed.

Question 1: Triangles OAM and OBM are congruent. Do you see why?

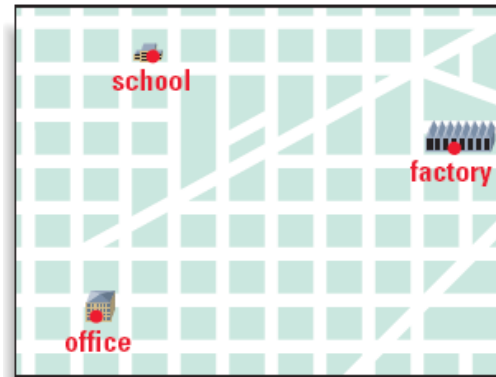
Question 2: What does this mean about OA and OB ?

Question 3: What about OC ? How is it related to OA and OB ?

Question 4: What does this prove about the circle?

Problem #2:

Your family is considering moving to a new home. The diagram shows the locations of where your parents work and where you go to school. The locations form a triangle.



In this diagram, how could you find a point that is equidistant from each location? Explain your answer.

Make a sketch, by hand, of the situation. Indicate the best location for the new home.