Team Problems for Chapter 5
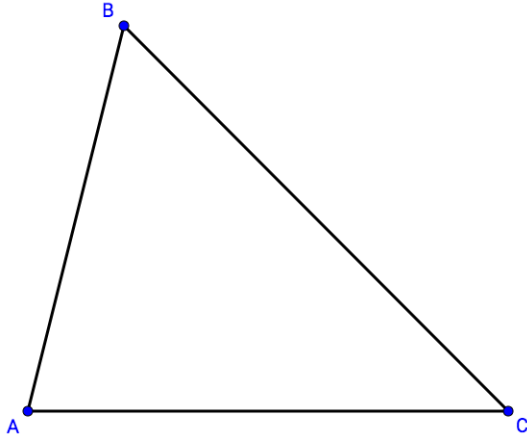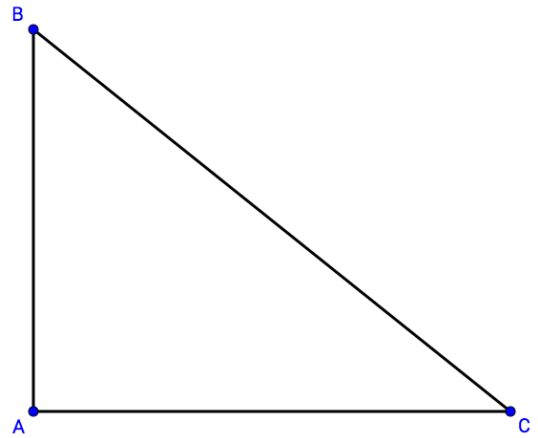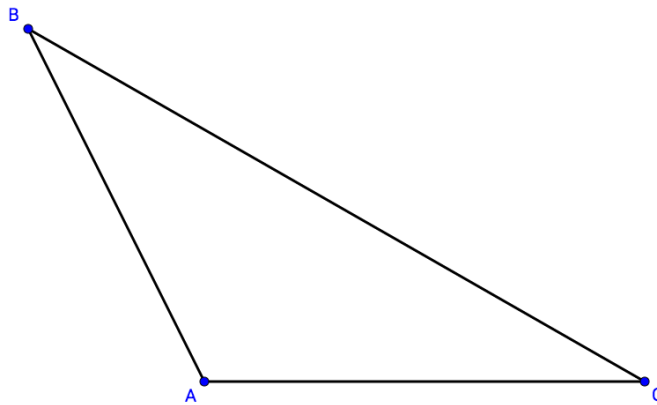
Name: _____

Date: _____

Problem #1: Constructing the Orthocenter

For this team problem you will need a protractor, a ruler, and some colored pencils.

For each of the triangles below, draw the altitudes from each vertex to the opposite side.
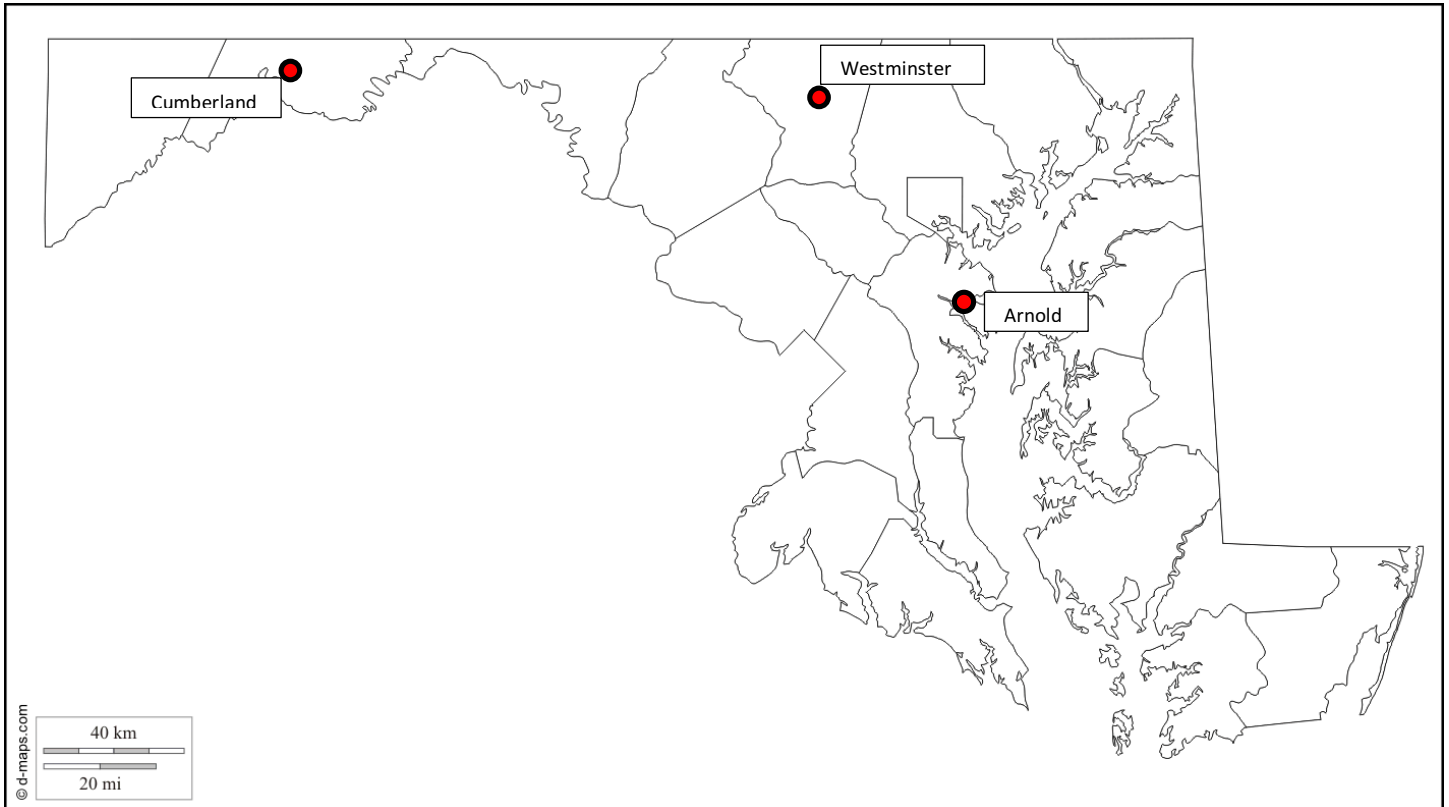
Acute triangle

Right triangle

Obtuse triangle

Label the orthocenter of each triangle.

Problem #2: : $\boldsymbol{EQUAL}$✈$\boldsymbol{AIR}^{™}$

For this team problem, you will need a ruler and a compass.

The new airline EqualAir wants to build an airport that is equidistant from three Maryland cities, Arnold, Cumberland, and Westminster. (The airport will not necessarily be in Maryland.)


1. Which triangle center is the appropriate choice for the location of the airport?

2. Construct the center you named in question 1.

3. Use a compass to draw a circle with the airport at the center and the three cities along the circle. How does this circle demonstrate that the airport is equidistant from the cities?

4. If you were making a recommendation to EqualAir, would this be your suggestion for an airport location? Why or why not?

Problem #3: The Sprinkler Problem

For this team problem, you will need a ruler, compass, and protractor.

AACC is installing a circular sprinkler (a sprinkler whose spray makes a perfect circle) to water the lawn between the sidewalks below, in the shape of a triangle. The sprinkler should be placed so as to cover as much lawn as possible without spraying the sidewalks.
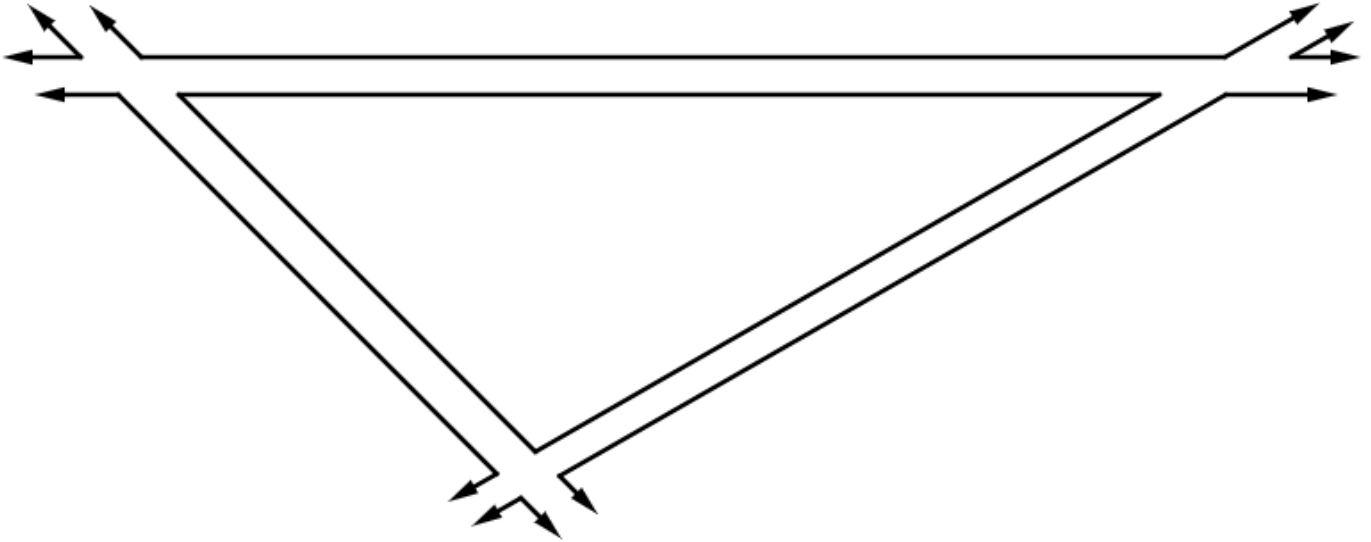
1. Why would AACC want to avoid watering the sidewalks?

2. Will the entire lawn get watered by this sprinkler? Why or why not?

3. One of the four triangle centers from this chapter is the perfect placement for the sprinkler. Which one, and why?

4. Construct this triangle center.

5. Use your compass to show the circle of lawn that will get watered. Shade this part of the lawn in.

Problem #4: Where's the Fire (Station)?

For this team problem, you will need a ruler and three different colors of colored pencils.

A city planner is trying to decide which fire station (*A, B,* or *C*) should cover a house at point *X* on the map below.

1. Use a ruler to draw the line segments $\overline{AB}, \overline{BC},$ and $\overline{AC}$.

2. Use a ruler to create the perpendicular bisectors of all three sides of the triangle *ABC*. Trace your perpendicular bisectors, and label the circumcenter of the triangle.

3. Shade the region(s) closest to fire station A, the region(s) closest to fire station B, and the region(s) closest to fire station C in three different colors.

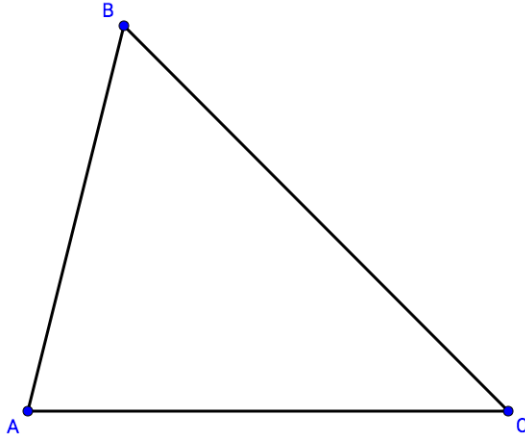In an emergency at house X, which station should respond? Explain your choice.

How did you use triangle centers to solve this problem?

Problem #5: Constructing the Centroid

For this team problem you will need a protractor, a ruler, and some colored pencils.

For each of the triangles below, draw the medians from each vertex to the opposite side.

Acute triangle

Right triangle
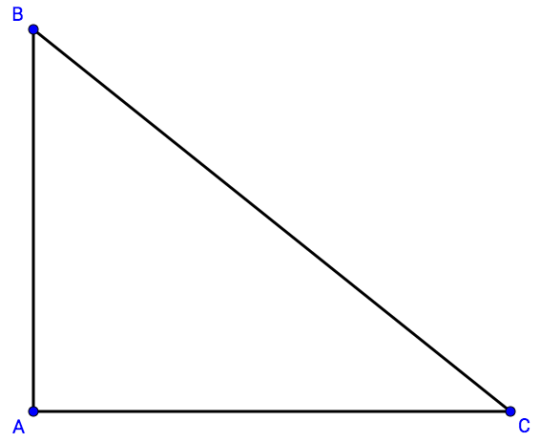
Obtuse triangle
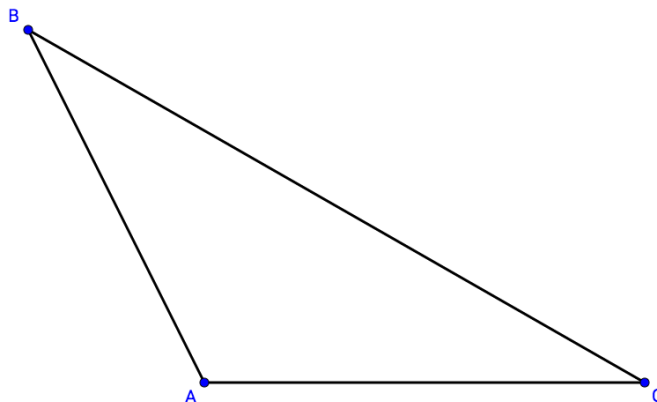
Label the centroid of each triangle.