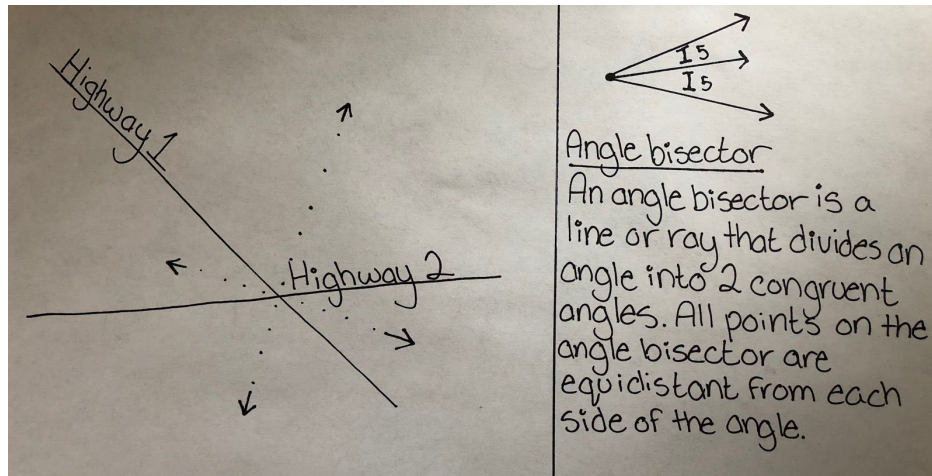Catelynn Anderson
Math 3 P.4
POW 6

POW 6 write up "On Patrol / The Time is Meow"

Problem Statement

We have to consider the following scenario: If two highways intersect in no specific way, in which places can police stations be placed so that the station is equidistant from each highway? What about 3 roads or more?

Visual representation

Process

I first thought that the two highways had to be perpendicular to one another so that I could say that for the station to be equidistant from each highway, the station would have to be on a line exactly in the middle of the two lines (which at the time I did not remember the correct term for), creating two complementary angles (angles that together create one 90 degree angle. I then was presented with the problem that the two highways could be intersecting in no certain way. Creating sets of both obtuse and acute angles. I began to ponder this thought, and came to the conclusion that the station would still have to be one a line that equally divides the angle into two smaller but equivalent angles. After research and help from peers, I was reminded that the correct term for a line that bisects an angle is called an angle bisector.

I then.. After a few days.. Realized that we are supposed to consider 3 roads, or even 4+. I tried to find ways that a station could be equidistant from three different highways, but came to the conclusion that a station can only be equidistant from two roads, so to make a station equidistant from 3+ roads, you'd need to add more stations. Imagine that in the picture provided above, one of the dotted lines is actually another road. You would just need to bisect the angles created by the three bisecting roads and place the stations anywhere on those lines.

Solution

For a station to be equidistant from two highways that intersect in any which way, the station must be placed anywhere on the line of the angle bisector that divides the angle which is

created by the two intersecting roads. The angle bisector can have an infinite length. Therefor, unless the two highways change direction, there are infinite placements for the station on the angle bisector line. For 3 roads that intersect, you would need to put more than one station on the multiple angle bisectors that could bisect the angles which are created by the roads. Same for 4 roads, 5, etc. You would just need to place multiple stations. (again, these stations can be ANYWHERE on the angle bisector line) But, if the roads were to all create a square and only intersect certain roads, then a station could be placed exactly in the middle of the square to be equidistant from all four roads. Same for 6 roads, etc. The station would just have to be exactly in the middle of the symmetrical shape that the roads create. (kinda sounds a little like what we are working on in the textbook)

Evaluation

(I wrote some of this before I realized that 3+ roads is actually part of the POW, so nevermind and good job Hannah! I thought I'd keep it here so that you could see that I accidentally came up with your same idea) This POW jogged my memory of certain terms such as the angle bisector. I personally think that this pow wasn't challenging enough, or in other words maybe we were given too much work time for such a short and easy problem. I enjoyed working on it in the beginning, but after I had found the solution to the problem, not much more was presented to me. If I were to change this POW at all, I would try to find ways to make it into something that requires more thought. This could be done by adding more variables such as a third intersecting road, so that students would have to find multiple solutions for a station to be placed between two of the three roads. For example, if you have roads A, B, and C, you could have student try to find where to put the station so it is equidistant from B and C, or A and C, and so forth. (again sorry I didn't see the entire POW at first)

Self assessment

I feel like I deserve a 100 on this assignment due to the fact that I found the solution early on and presented all evidence and explanation for my solution in this write up with both words and visuals.