Due date : July 7, 2016

- 1) You have a choice at the local pizza place : For the same price, either you can get one large pizza, or both a small and a medium. How can you determine which way you get more by using just the Pythagorean theorem and knowing the diameters of the different sizes of pizza? Describe an easy procedure to figure out which deal to choose.
- 2) Triangulate the floor plans by adding straight segments that do not cross each other yet span the insides and extend from one vertex to another.



3) For each triangulation below color the vertices red, green or blue, so that every triangle has all three colors.



- 4) If we use our standard distance metric, the set of points that are equidistant from a given point form a circle. In a city, a more useful distance metric is given by the taxicab metric. Draw a grid, denoting the roads in the city, and mark points that are at a distance of 5 blocks from a given corner. What does the shape resemble? Do the same exercise in the case of 6 blocks, 7 blocks, 8 blocks.
- 5) I am standing on a point A on Earth. I travel a 100 miles south, then a 100 miles east and then a 100 miles north. I realize that I am back in point A. Can you figure out all such points on Earth which will lead to the experience described above?