Things to Think on Week 9

1. A wire is 120cm long. Can you bend it into the shape of a cube where each side is 10cm long? If not, how many cuts would you need to make in order to form a cube?

2. Prove that in any graph it's possible to delete some vertex (together with all the edges coming out of it) and still have a connected graph.

3. Prove that a connected graph with 2n vertices of odd degree can be drawn with no edge drawn more than once in such a way that the pencil will be lifted off the paper exactly n-1 times.

4. Find the smallest whole number with the property that: (a) it ends in 2, and (b) if you move the 2 to the beginning of the number, the number is doubled.

5. A straight line is colored with two colors. Prove that we can find a line segment (of non-zero length) with its endpoints and midpoint colored the same.