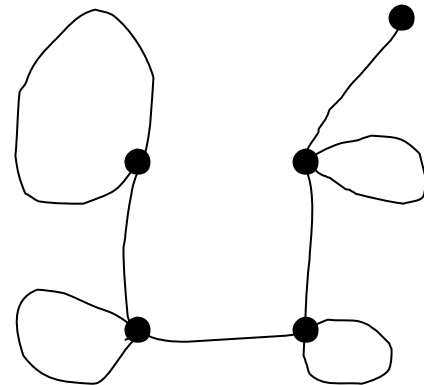
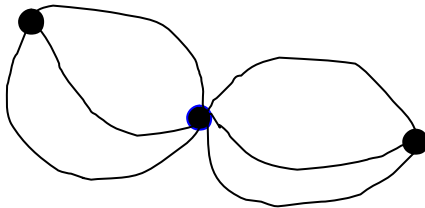
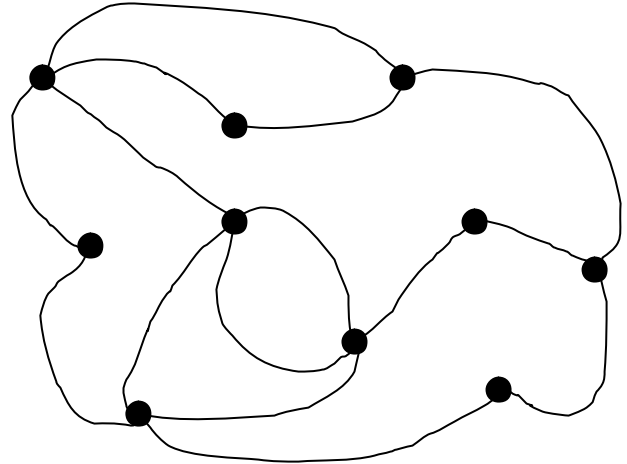
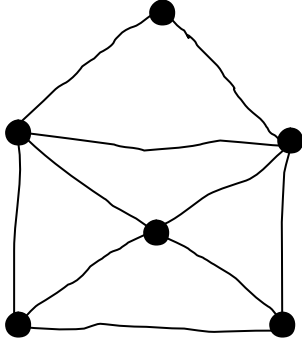




Strand: Space

Substrand: Represent Location

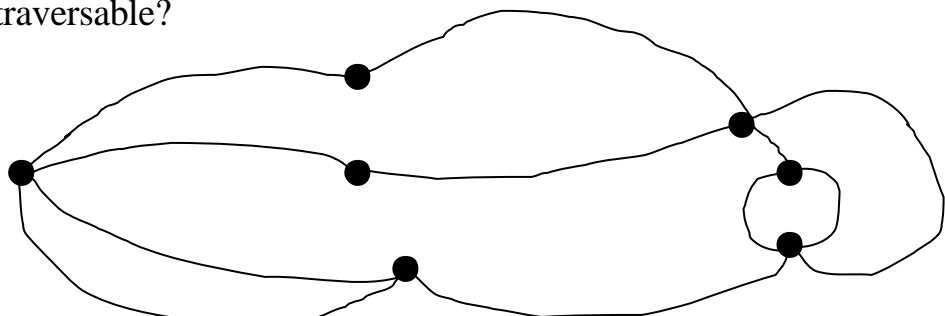
1 a) These are networks. See if you can trace over each line without lifting your pencil.



1 b) A network is said to be traversable if it can be traced (or travelled) without lifting the pencil from the page or going over the same line twice. Are the networks above traversable?

1 c) The heavy dots are called nodes or vertices, these are joined by paths. The first network has 6 vertices and 10 paths, check this. Next to each of the other networks write down how many vertices and paths they have.

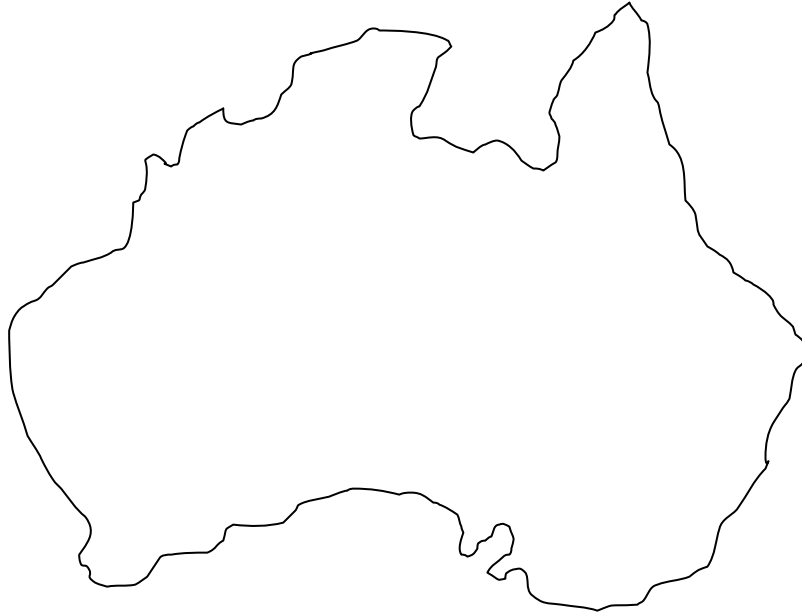
2 a) Is this network traversable?



2 b) This network is divided into 6 regions, 5 inside and 1 outside. Colour the inside regions with the least amount of different colours as possible so that no two colours the same are next to each other.

2 c) How many regions are there for each network in question 1. Investigate a pattern or rule which links the vertices (v), paths (p) and regions (r). Show all working.

3 a) This is a rough sketch of Australia, excluding Tasmania for this exercise. Draw in the different states and the Northern Territory. Using the least amount of colours , colour each region so that no two colours are drawn together.

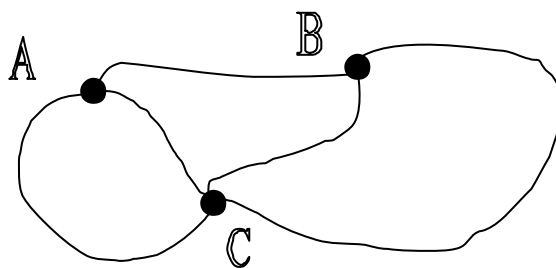


3 b) How many vertices, paths and regions are there?

3 c) Does this fit in with the rule (Euler's Rule) you made up for question 2?

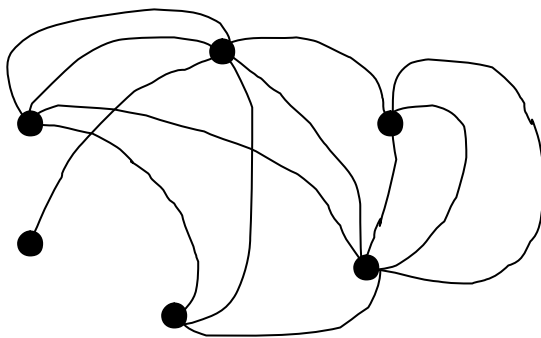
3 d) Is this network traversable?

4 a) This network has 3 vertices. A is an odd vertex because it has 3 paths, similarly B is also odd, C is even. Is this network traversable?

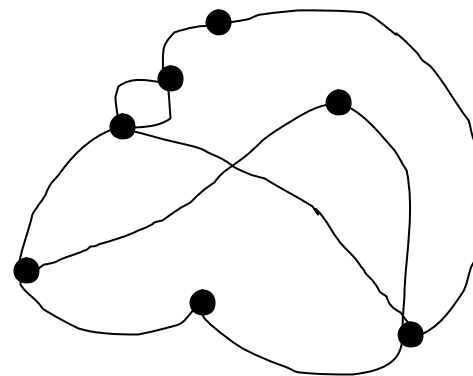


4 b) Look at each node in the networks for question 1 and 2, are they odd or even? How many odd vertices are there, how many even vertices are there? Investigate to find a rule that will determine if a network is traversable or not.

4 c) Use your rule to confirm if these networks are traversable or not.



Telephone cable system.



Computer network.

5. Greg was in the school setting up the new computer terminals. There were to be 6 different stations around the school. One was to be located at the library and this one had to be linked to all other terminals, except the terminal in the main office. The computer in the main office was only to be linked to the Deputies office. The Year 8, 9 and 10 sub-schools each had their own computer terminals, they communicated often and asked Greg to link them up. The Deputies terminal was connected to the year 9 and 10 terminals. Draw a network to represent this situation. Also show that it fits Euler's Rule and whether or not it is traversable.

6) Draw a network to represent the following. A group of 4 friends decide to meet at the beach after school. Mandy has to go home to get her bathers first, Rob and Josh want to go to the shop before they go home to their respective houses to get their gear. Ali has her bathers but has to drop in and see her mum before she walks to Mandy's, then to the beach with her. Josh ends up dropping in and seeing Clayton along the way to see if he would like to go too. Rob leaves straight from home.

7) Towns A,B,C,D and E have a fairly complicated rail system. Town C is the busiest terminal, you can catch a train to all other centers from there. Town A only has one railway out, that is to Town B. Town D can only be accessed from town C, but it has a line going to Town E. Town B has a line coming in from Towns E and C as well as A. Represent this on a network diagram.

Reflection

What have learnt about networks?

What is Euler's Rule?

What does it determine?