



What is a graph?

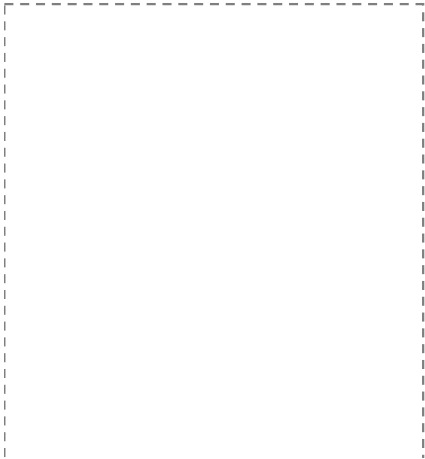
**Year 11
General Mathematics**

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Learning Objectives

By the end of the lesson I hope that you understand and can apply the following to a range of questions from the Unit 1 and 2 General Mathematics course.

- Understand what a graph is
- Understand why a graph is important to us in the real world
- Understand what the following parts of a graph are:
 - Vertex
 - Edge and multiple edges
 - Degree of a vertex
 - Loop



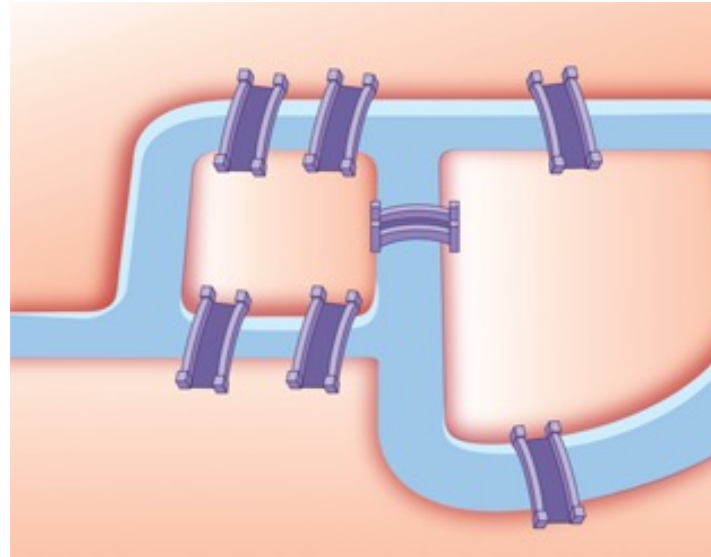
Recap

In the last lesson we looked at the problem of whether it was possible to cross all the bridges only once in the diagram shown to the right.

We discovered that we can save ourselves a lot of heartache by using something which Euler discovered:

When the degrees of the vertices are all odd, it is not possible to cross all bridges only once if we wish to go across all of them.

This lesson we are going to put into practice the skills we have learned from the last lesson.



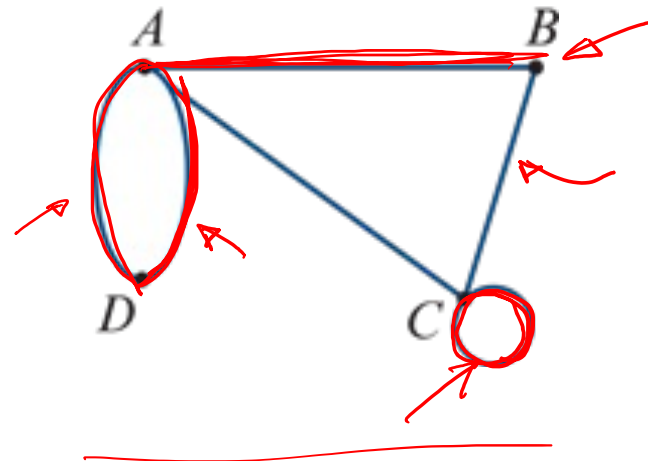
More language

You can absolutely smash this section of work if you have a **very detailed summary book** listing all the definitions with some good examples of graphs.

The people who fail this section of work really have their own summary books to blame (or lack thereof!).

Looking at the graph on the right we can see that we have some new elements:

- **Loop:** This is where we leave a vertex and travel straight back to the same vertex without passing through any other vertex.
- **Multiple edges:** We can see that there are two roads which will take us between A and D. As there is more than one way to go from A to D we say there are multiple edges connecting them.



A gotcha about Loops!

It is really important to know that:

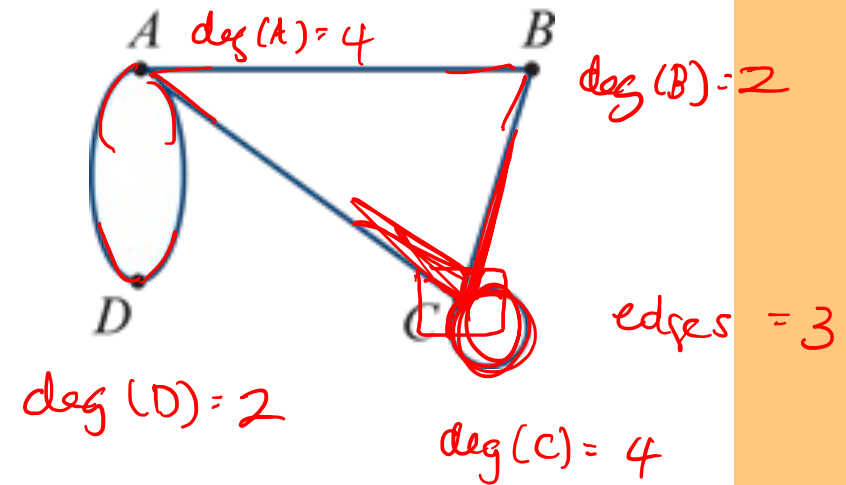
A loop has two edges when we consider it as a degree of a vertex.

So, vertex C would have degree 4!!

The graph has 6 edges and 4 vertices.

Lots and lots of people get tricked with this.

Note: The plural of vertex is vertices.



Work to be completed

The following represents the minimum work which should be completed.

The more questions you answer from each exercise, chapter review and Checkpoints the better your chance of gaining an excellent study score in November.

General Mathematics Units 1 and 2 Textbook

Chapter 9

Exercise 9B: What is a graph?

Questions: 1 to 5 inclusive

