

Computing for Mathematics: Week 1

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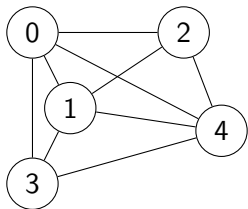
$$\begin{pmatrix} (0,0) & (-1,1) & (1,-1) \\ (1,-1) & (0,0) & (-1,1) \\ (1,-1) & (-1,1) & (0,0) \end{pmatrix}$$

Programming and Mathematics

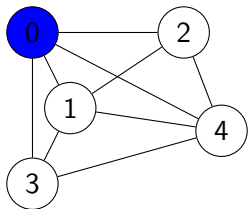
There are various areas in which computers are of major importance to Mathematicians:

- ▶ Computer assisted proofs;
- ▶ Implementation of mathematics;
- ▶ Computer generated proofs;
- ▶ Everyday mathematics.

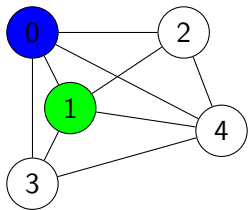
Computer assisted proofs



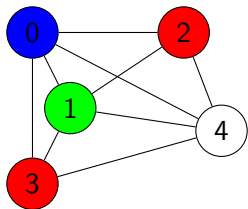
Computer assisted proofs



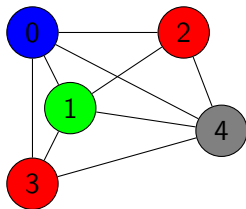
Computer assisted proofs



Computer assisted proofs

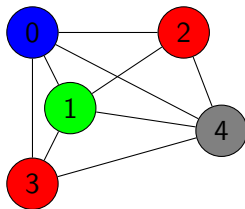


Computer assisted proofs



- '4 colour theorem': **Any map can be coloured using 4 colours.**

Computer assisted proofs



- ▶ '4 colour theorem': **Any map can be coloured using 4 colours.**
- ▶ Proved in 1976 by Kenneth Appel and Wolfgang Haken:

Used computers to check 1936 particular cases.

Computer assisted proofs

Slide about sphere packing problem.

Implementation of mathematics

Show Leanne's model

Computer generated proofs

Show a computer generated proof

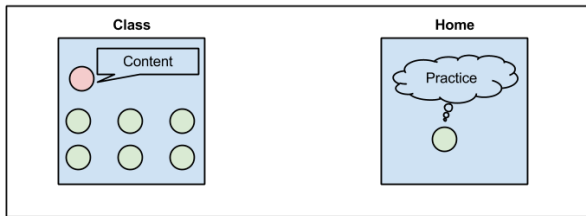
Everyday mathematics

Show a simple integral

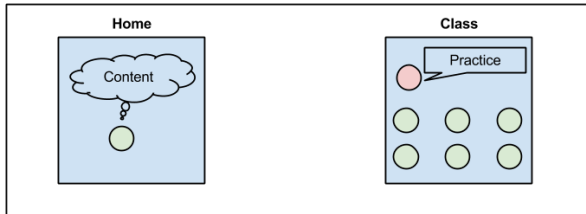
Flipped classrooms

Flipped classrooms

**Classic
Classroom**



**Flipped
Classroom**



'Tickables'

Include bullet points

Resources

Show resources.

Some code

Here is some example code:

```
1 for i in range(10):  
2     print 'The number is: ', i
```