MONASH University

MONASH
ENGINEERING
ENG1060

WELCOME TO ENG1060: COMPUTING FOR ENGINEERS

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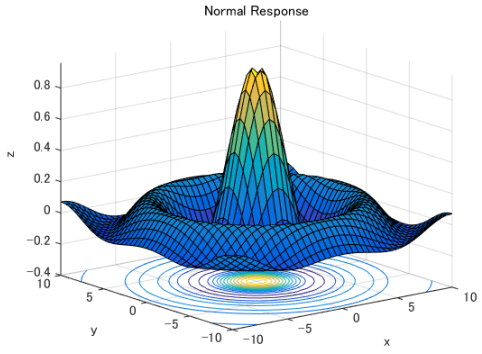
Slides by Tony Vo

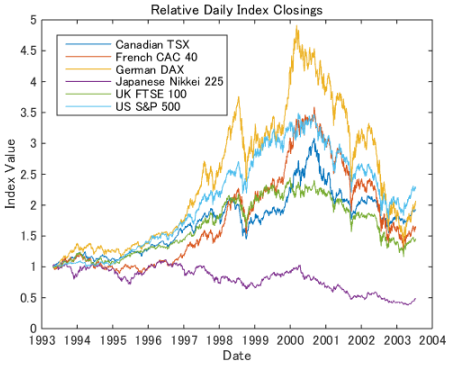
GROUP OF EIGHT AUSTRALIA

MATLAB

- Use MATLAB to
  - Think as an engineer
  - Develop problem solving techniques
  - Understand commonly used numerical methods
  - Create and visualise data for engineering problems

MATLAB®
The Language of Technical Computing

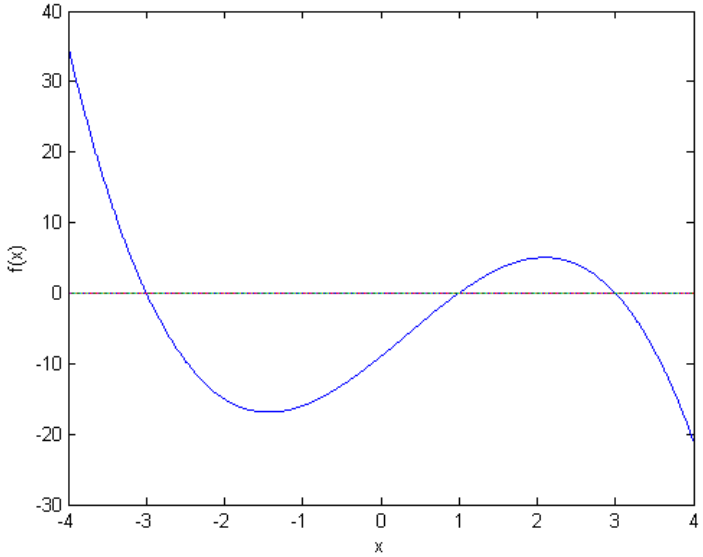




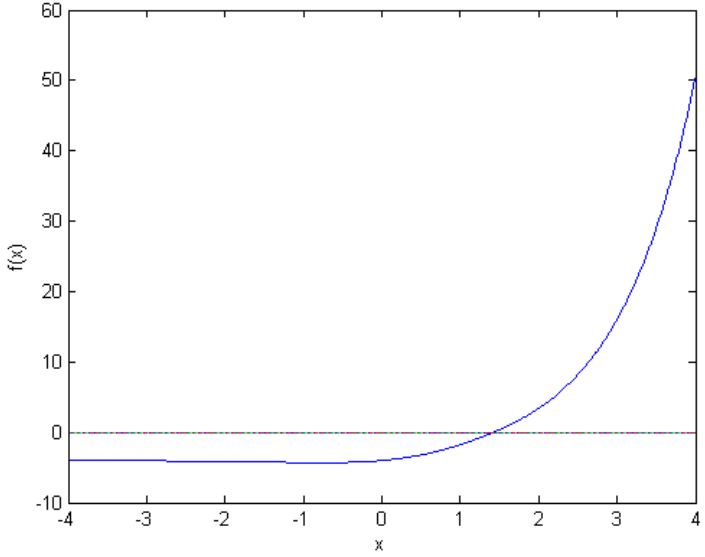
NUMERICAL METHODS

- Root finding

f(x) = -(x+3)(x-3)(x-1)

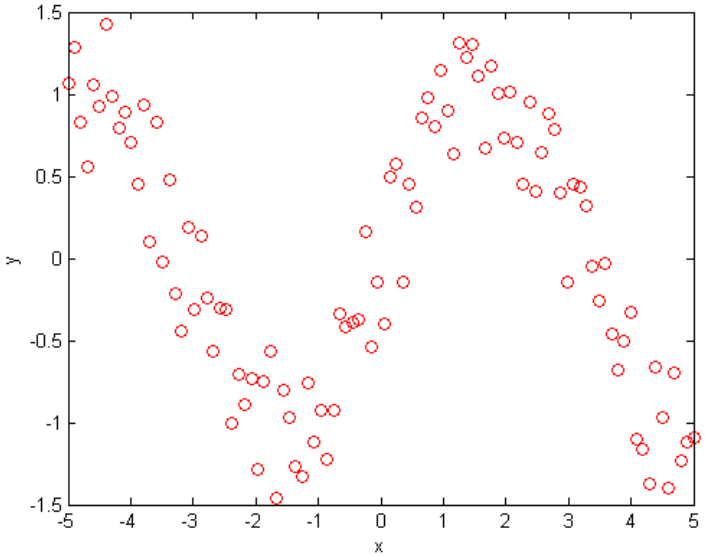


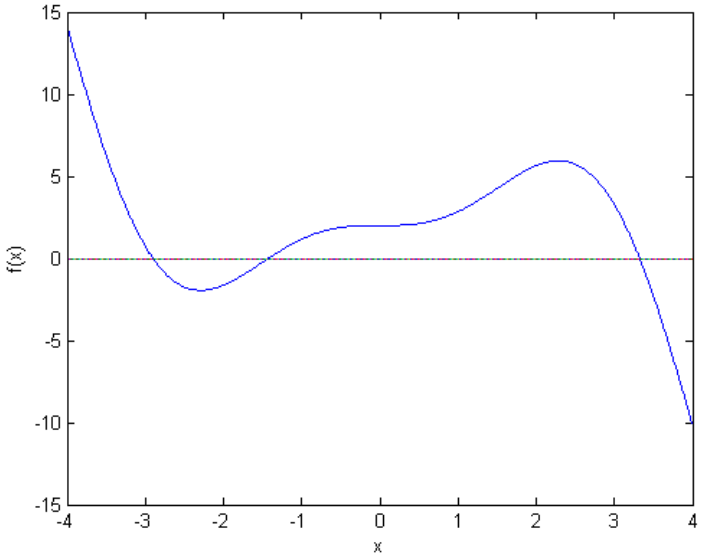
$$f(x) = \frac{\tanh(\sinh(x))}{e^{-x}} - 4;$$



NUMERICAL METHODS

- Curve fitting
- Numerical integration

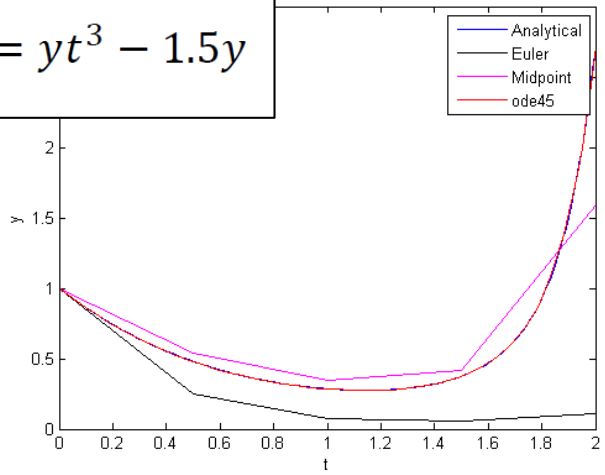




NUMERICAL METHODS

- Ordinary differential equations
- Linear systems

$$\frac{dy}{dt} = yt^3 - 1.5y$$



$$9x + 13y = 2$$

$$-3x - 5y = 2$$

$$-3x_2 + 7x_3 = 2$$

$$x_1 + 2x_2 - x_3 = 3$$

$$5x_1 - 2x_2 = 2$$

3A + 2B - 4C + 5D + 3E + 2F = 74

4A - 5B + 2C + 3D - 2E + 5F = 53

6A - 3B + 7C - 2D + 3E + 5F = -6

-2A + 4B - 3C + 7D - 4E + 3F = 120

3A + 7B - 4C + 5D + 6E + 2F = 87

-4A + 5B - 3C - 6D + 7E + 2F = -49

PROGRAMMING BASICS

- Matrices
- Plotting
- Functions
- If statements
- Looping
- Debugging

- Check out the "how to install MATLAB" video