

# Homework Assignment 2: Edition 6

- **5.4; 5.15; 5.16; 5.17**
- **6.7; 6.9; 6.16; 6.30; 6.31**  
**and the problem in the next slide**

**C= SN/100000, where SN is your student number**

Given the sine-polynomial;

$$P(x) = -(C / 25)x^2 \sin^5 x + (-x^5 + 2 - 4x^2) \sin^3 x + \\ (2x^5 - 2x - 2x^4) \sin^2 x + (3x + 2x^4 - 4 - x^2 - 4x^5) \sin x + \\ 2 + 8x^5 - 4x^4 - 7x^3 - x + (C/ 27)x^2$$

Knowing that this function has three roots in the interval  $[-1.5, 2.5]$ , to be sure plot the given function over that interval. Find the roots of the above polynomial correct to 100 SFs **Using Maple** :

- i.** Find the roots using the bisection method (how many iterations needed).
- ii.** Find them using the Newton Raphson method (how many iterations needed).
- iii.** Find them using the secant method (how many iterations needed).
- iv.** Find them using the Newton's second formula (how many iterations needed) which is given as:

$$x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i) - \frac{f''(x_i)f(x_i)}{2f'(x_i)}}$$

- v.** Compare between the results and the methods of parts **(i to iv)**.