

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;

$$\begin{aligned}P(x) = & -(C/25)x^2 \sin^5 x + (-x^5 + 2 - 4x^2) \sin^3 x + \\& (2x^5 - 2x - 2x^4) \sin^2 x + (3x + 2x^4 - 4 - x^2 - 4x^5) \sin x + \\& 2 + 8x^5 - 4x^4 - 7x^3 - x + (C/27)x^2\end{aligned}$$

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)**.