IT Problem 2

Answer the following questions. Submit one Excel file with 2 worksheets

- "Polynomial": solution of Problem A
- "Linear": solution of Problem B

In each worksheet please add your comments explaining what you have done in a Text Box (use Insert->TextBox).

Each of the questions A,B carries equal weight (2.5 marks each).

1. Solving polynomials

Show how Solver can be used to find roots and local minima and maxima of smooth functions, using the following problem as example.

a. Find a real root of the polynomial $p(x)=x^4 - 2x^3 - 8x^2 - 4x + 3$.
b. Having found one root, progressively find the rest of the real roots (assuming they are all different).
c. Find a (local) minimum value of p(x).
d. Having found one minimum, find the other assuming it is different.
e. Having found the minima, find the local maximum between them.

Explain how your procedure would differ for a polynomial of odd degree.

2. Solving constrained linear problems

Show how Solver can be used to solve constrained linear problems, using the following problem as an example.

You have three non-negative variables – x, y, z. You are told that:

$$x + y + z \leq 6$$

$$x + 2y + 3z \leq 10$$

$$3x + 2y + 2z = 15$$

What is the maximum value that the following function can take, given these constraints:

$$x + 9y + z?$$