NAME: _____

(1) Solve the following equations.

(a) $-4x^3 + 6x^2 + 2x = 0$
(b) $6 + 11x + 6x^2 + x^3 = 0$
(c) $11 + 6x + x^2 = -\frac{6}{x}$
(d) $x^3 - 2x = 0$

(2) Use the data in the attached file HW3_data.xlsx and Solver to find the coefficients A, B, and C in the following equation to fit the data:

$$\log_{10}(p^*) = A - \frac{B}{C + T}$$

(3) Minimize $3x_1 - 5x_2$ subject to the following constraints:

$$x_1 \geq 4$$
$$x_1 \leq 8$$
$$x_2 \geq 2$$
$$x_2 \leq 5$$
$$\frac{1}{2}x_1 - x_2 \geq -1$$
$$\frac{1}{4}x_1 - x_2 \leq -1$$

(4) A manufacturer produces products A, B, C, and D, by using two types of machines (lathes and milling machines). The time required on the two machines to manufacture one unit of each of the four products and the profit per unit product are given below:

Machine	Time required per unit for product (minutes)			
	A	B	C	D
Lathe	7	10	4	9
Milling machine	3	40	1	1
Profit per unit	45	100	30	50

The total time available on the lathes and milling machines per day is 1200 and 800 minutes respectively. Find the number of units to be manufactured of each product per day for maximizing profit.