HW 13 Engr 1181 Problem 1 taken from MATLAB by Gilat Chapt 6 Problem 13 4th edition.

Problem 1 Part 1) 2 pts. Write a program using a loop that determines the expansion expression below that is used to estimate π.

$$\sqrt{12}\sum_{n=0}^{m}\frac{(-1/3)^n}{(2n+1)}$$

You will need to use format long. See page 13.
Use from n= 0 to m= 20. (∑ means sum all the individual values.)

Part 2) 1 pt. Compare your result with the value of pi by calculating the % error.

$$\%\ \text{error} = \frac{(\text{Your value} - \text{pi})*100}{\text{pi}}$$

Problem 2) 2 pts. The following data fits a polynomial of the form:
$Y = ax^3 + bx^2 + cx + d$. Use Matlab to fit the data to this polynomial to find a, b, c and d. Your output should show explicitly a = _____ etc.

x	y
-1	-3.5
2	45.1
5	392.5
8	1459.9
11	3668.5
14	7439.5
17	13194.1

Problem 3) You have the following data for Time and Temperature for a very cold Cryogenic system.

Time (s)	Temp (deg K)
1.21	2.99
1.8	3.42
3.01	4.06
3.67	4.33
4.69	4.70
5.49	4.96
7.12	5.41
8.01	5.62

a) Graph Temperature vs. Time. Use xlabel, ylabel and title.

b) Find the equation for the relationship between Temperature and Time. You expect the data to fit an equation of the form $T = At^{(1/3)}$ where T = Temperature in degree Kelvin and t = Time in seconds.
Hint: Take the cube root of all the time values then fit Temperature as a straight line function with $t^{(1/3)}$. You can use the command polyfit or other line fitting method in Matlab. The slope will be A.