EGN 3420 EXAM 3 Su 95

Problem 1

The following table contains vehicle stopping distances as a function of speed.

V (mph)	D (ft)
20	42
25	56
30	75
35	92
40	116
45	143
50	173

A) Find

1. the least squares regression line thru the data points, $D = a_0 + a_1 V$
2. the following sum of squares: SST, SSE, and SSR.
3. the coefficient of determination r^2 and the correlation coefficient r.

B) Fill in the table below and find the equation of the least squares quadratic, $D = a_0 + a_1 V + a_2 V^2$

V_i	D_i	V_i^2	V_i^3	V_i^4	$V_i D_i$	$V_i^2 D_i$
20	42					
25	56					
30	74					
35	92					
40	116					
45	143					
50	173					
ΣV_i	ΣD_i	ΣV_i^2	ΣV_i^3	ΣV_i^4	$\Sigma V_i D_i$	$\Sigma V_i^2 D_i$

C) Calculate SST, SSE, SSR, r^2, and r.

D) Plot the given data points, the least squares line and the least squares quadratic on the same graph.

Problem 2

Estimate the function $f(x) = e^x$ at x=1 by fitting a 3rd order Newton Divided Difference polynomial thru the four points:

$(0, e^0)$, $(0.5, e^{0.5})$, $(1.5, e^{1.5})$ and $(2, e^2)$.

Express the coefficients b_i, i=0,1,2,3 to five places after the decimal point and use them to estimate f(1).