Concordia University
FACULTY OF ENGINEERING AND COMPUTER SCIENCE

COURSE	NUMERICAL METHODS IN ENGINEERING – ENGR391
EXAMINATION ASSIGNMENT 2	TERM Winter 2018
Name	
ID	
Section	
Instructions:	• Solve the problem below using MATLAB. • Annotate your MATLAB code to explain it. • On Moodle, submit 2 files: one *.m* file for your Matlab code and one .pdf for the plots generated • Use your last name and ID as the name of the files you submit, e.g. *lastname_idnumber.m & lastname_idnumber.pdf* • Submission deadline is March 29th at 5:45 pm

Problem statement:

The following data was obtained when the stopping distance d of a car on a wet road was measured as a function of the speed V when the brakes were applied:

V (mph)	12.5	25	37.5	50	62.5	75
$d\ (ft)$	20	59	118	197	299	240

a) Using Matlab, make a plot of the data d versus V. Use an asterisk marker for the data points.
b) Write a Matlab user defined function that determines the coefficients of a quadratic polynomial $f(x) = a_0 + a_1 x + a_2 x^2$ that best fits a given set of data points. Name the function $a = QuadFit\ (x, y)$, where the input arguments x and y are vectors with the coordinates of the data points, and the output argument a is a three-element vector with the values of the coefficients a_0, a_1, a_2.
c) Using Matlab, plot the polynomial obtained in b). Use a solid line for the polynomial plot.
d) Use Matlab's built-in function polyfit to create a quadratic polynomial fit to the data and recreate the same plot as in c).