Engineering 12 - Spring 2001
Test 1 Part 2

YourName:_____

Section: **Needy** **Cugini**
(**Marano** **Budny** **Budny (IC section)**

Group Members
1 _____
2 _____
3 _____

Please write neatly and show all of your work. Adequate space for your response has been provided following each question. If you need additional room, turn to the backside of the page or ask the instructor for paper. Good luck!!

Question	Possible Score	Actual Score
1	15	
2	8	
3	8	
4	6	
5	15	
6	10	
Total	**60**	

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(15 Points) For the script below, answer the following questions:

```
Line 1    a = [12 17 -45 53 47];
Line 2    N=5
Line 3    for m=1:N
Line 4       if ( m==1 )
Line 5          disp(a(m))
Line 6       elseif ( (m==3) | (m>=4) )
Line 7          disp( a(m-1) )
Line 8       else
Line 9          disp( a(3) )
Line 10      End
Line 11
```

a) What does the semicolon at the end of Line 1 do?

b) Explain what Line 4 does

c) Write the outputs from the code in the table below (The code may not have 9 outputs)

Output 1	
Output 2	
Output 3	
Output 4	
Output 5	
Output 6	
Output 7	
Output 8	
Output 9	

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2) **(8 Points)** The following data are stored in the variable **data**:

2	3	4	7
1	1	0	9
4	2	3	1

Write the MATLAB command that will set the variables equal to the indicated portion of **data**:

Y = 2
1
4
MATLAB Command: Y =

X= 3
1
2
MATLAB Command: X =

Z= 2 3
1 1
MATLAB Command: Z =

S= 4 2 3 1 MATLAB Command: S =

3) **(8 Points)** The polyfit command attempts to fit a polynomial ($a_n x^n + a_{n-1} x^{n-1} + \ldots + a = y$) to a dataset.

For the following polyfit results (each for a different dataset), write the polynomial equation represented by the output of the polyfit command:

1. polyfit output = 1 2 0 0.2 equation:
2. polyfit output = 1 1 equation:
3. polyfit output = 1 0 0 2 equation:
4. polyfit output = -1 0.3 0.5 -0.8 0.1 equation:

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4) **(6 Points)** For the following MATLAB commands, what is the resulting value of y?

```
x=[2 3]
func_f='x.^2+x'
y=eval(func_f)
```

y =

5) You wish to write a script that will analyze the following function:

$$f(x) = \frac{x \sin(x+1)}{x-6}$$

5a) **(6 Points)** Write the m-file required to define this as a MATLAB function.

5b) **(9 Points)** Assume the script you wrote above is correct, and you know this function has a root at approximately x = -7 and a local minimum between -4 and -2.
Write a very simple MATLAB script (no comments are required) that will use the m-file defined above to: plot the function between x = [-10 and 10], then find the x location of this root and then find the x and y coordinate of this local minimum.

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6) **(10 Points)** There are a number of errors in the following MATLAB code. Find 5 of these errors. List the row number that the error is in, explain what the error is, and how to fix it. Assume the numbers along the left edge are the not actually in the code, they are listed so you can use them to list the row the error is located in.

```
1   %Program finds the area under a curve using a function defined in the m-file
2   %classfun.m

3    doagain='y'
4    while doagain=='y'
5       disp("find the area under the curve")
6       startx=input('Enter the Starting point for the area: ')
7       endx=input('Enter the End point for the area:  ')
8       divisions=input('Enter the number of divisions for the trapz command:  ')
9       delta_x=(endx-startx)/divisions;
10      x=startx,delta_x,endx;
11      y=feval(classfun,x);
12      trap_area=trapz(x,delta_x,y)
13      quad_area=quad('classfun', startx, divisions, endx)
14      doagain=input('Do Again? (y/n)  ','s')
15   end
```

Error 1

Error 2

Error 3

Error 4

Error 5