1.

% Solution Script to question 1

% By Gary Carr 11/12/2012

% Solve the linear equation

% The values of x, y and z are seperated by commas, then a semi colon which

% indicate the end of each line. The matrix is then stored as variable a.

% The vectors are seperated by semi colon’s and stored as b.

% The matrix divided by the vector generates the values for x, y and z

% and these are stored to variable (x)

a= [4,3,2;1,-1,2;10,4,-5]

b=[16;5;3]

x=a\b

% The below prints out the values to the user

disp(['x = ', num2str(x(1,:))])

disp(['y = ', num2str(x(2,:))])

disp(['z = ', num2str(x(3,:))])

Matlab Output

a =

4 3 2

1 -1 2

10 4 -5

b =

16

5

3

x =

1

2

3

x = 1

y = 2

z = 3

Final answer:

x = 1

y = 2

z = 3

2.

% Solution script to question 2 - Plot answers to a graph

% By Gary Carr 11/12/2012

% Hold on allows us to plot multiple lines onto the same graph

hold on;

% Linspace generates vectors between and including 0 and 8\*pi. 100 is the % number of points on the graph

x = linspace(0,8\*pi,100);

% Works out the cosine of x and saves as variable

y1 = cos(x);

% Works out the sine of x multiplied by x and saves as variable

y2 = x.\* sin(x);

% Works out the square root of x to an absolute value and saves as variable

y3 = sqrt(abs(x));

% Plots the results onto a graph

plot(x, y1, x, y2, x, y3)

%Adds x and y labels to the graph

xlabel('X');

ylabel('Y');

%Adds a legend to the graph

legend ('Cos(x)', 'x\* sin(x)', 'Sqrt(abs(x)', 3);

Matlab Output



3)

% Solution Script to question 3

% By Gary Carr 11/12/2012

% Solution script to Question 3A – Find the inverse

%

% First store the matrix as a variable z

z=[4, 3, 2;1,-1,2;10,4,-5]

% To find the inverse the inv function is used and applied and stored

% to the variable A

A=inv(z)

% Solution script to Question 3B - Store A\*A as variable B

B=A\*A

Matlab output – 3A

-0.0330 0.2527 0.0879

0.2747 -0.4396 -0.0659

0.1538 0.1538 -0.0769

Matlab output – 3B

0.0840 -0.1059 -0.0263

-0.1400 0.2525 0.0582

0.0254 -0.0406 0.0093

4a.

% Solution Script to question 4

% By Gary Carr 11/12/2012

% Solution script to question 4a – Fit a polynomial

%

% Store the figures as variables x and y

x = [-10, -7.7778, -5.5556, -3.3333, -1.1111, 1.1111, 3.3333, 5.5556, 7.7778, 10];

y = [-8.3538, -1.9484, -0.1945, 0.0034, -0.0020, 0.0493, -0.0246, -0.1978, 0.4141, 4.2042];

% Equate the figures with polyfit with a degree of 5

% The polyfit function performs this task. X and y are the variables and 5

% is the curve

polyfit(x,y,5)

% Solution script to question 4b – Find the root

%

% The roots function performs this task on the ans (answer) and outputs the

% roots of all the polynomials

roots(ans)

Matlab Output 4a

ans =

0.0001 -0.0002 -0.0040 -0.0010 0.0279 0.0252

Matlab Output 4b  
ans =

6.9999

2.9999

-4.0013

-2.9990

-0.9993

5.

% Solution Script to question 5

% By Gary Carr 11/12/2012

% Function takes two user defined parameters, the Matrix (A) and the

% vector (b) and trys to find a determinant following a linear equation.

% X is outputted to tell the user if a solution is found

% A is the matrix, b is the vector. Question5 is the name of the function

function [x] = Question5 (A,b)

% If the determinent is not zero, solves equation and prints x

if det(A) ~= 0

x =A\b

% If the determinant is zero, x is equal to a message to the user

% informing them there is no solution

else x = 'There is no solution to this'

end

Matlab output for test on 5A

**x =**

**0.0000**

**1.0000**

**2.0000**

**3.0000**

Matlab output for test on 5B

x =

There is no solution to this