Matlab script(hw.m):

```
%From lines 10 to 26 is where all the algorithm requirements for the
%assignment


%This defines the range of the x-values, in this assignment, it
%should be -10 to 10
x = linspace(-10, 10, 100);
% Define the first function listed
f1 = @(x) x.^2 - 4;

% Find the roots of said function using the coefficients of the function using matlab's "root" function
rootsf1 = roots([1, 0, -4]);

% Ditto(same as before but for second function)
f2 = @(x) x.^4 - 3*x.^3 - 10*x.^2 + x + 2;
rootsf2 = roots([1, -3, -10, 1, 2]);

% Output  the roots
disp('Roots of y = x^2 - 4:');
disp(rootsf1);
disp('Roots of y = x^4 - 3x^3 - 10x^2 + x + 2:');
disp(rootsf2);

%Everything after here is just so a graph is outputted
%along with the roots in command window  as I just want a visual representation
% just to see if the output from the preceding code is correct or not.

% Plot both functions
plot(x, f1(x));
hold on;
plot(x, f2(x));
hold off;

% This should add the roots marked as green circles(hence the 'go' or 'g'  in the plot functions)
hold on;
plot(rootsf1, zeros(size(rootsf1)), 'go', 'MarkerSize', 10);
plot(rootsf2, zeros(size(rootsf2)), 'go', 'MarkerSize', 10);
hold off;


% This just makes both functions visible, without this 'ylim', the graph
% just cuts off when y is less than 0(atleast on my screen)
ylim([-10, 10]);

% Just basic graph interface and appearance
title('HW 1 PHYS 270: Graph of y = x^2 - 4   and y = x^4 - 3x^3 - 10x^2 + x + 2  ');
xlabel('x');
ylabel('y');
legend('y = x^2 - 4', 'y = x^4 - 3x^3 - 10x^2 + x + 2', 'Roots');
grid on; % Enable grid lines
```

Output on Matlab

Command Window

```
>> hw1
Roots of y = x^2 - 4:
     2.0000
    -2.0000

Roots of y = x^4 - 3x^3 - 10x^2 + x + 2:
     4.9593
    -2.0000
     0.4698
    -0.4292

fx >>
```