MATHEMATICAL FOUNDATIONS LAB TEST – CA1

S VARUN 21PC26

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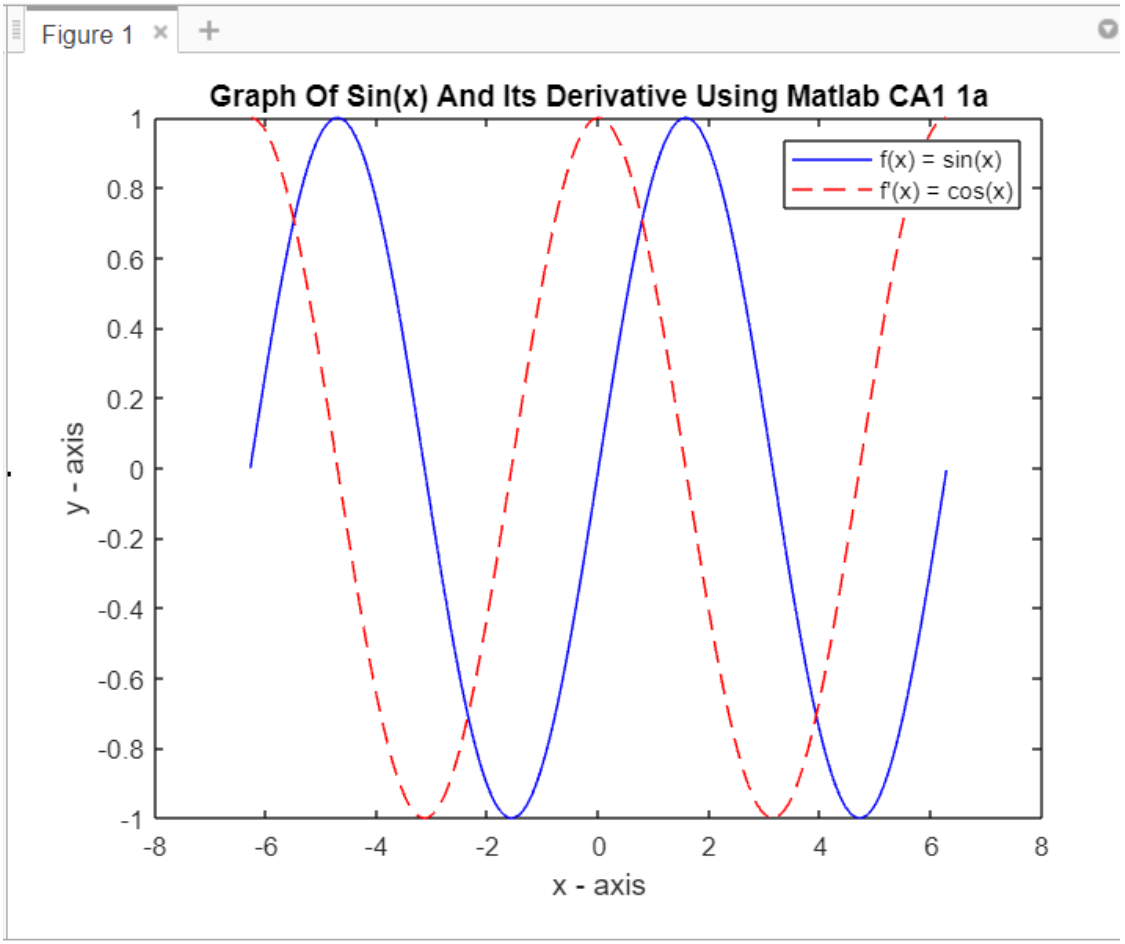
1. A)

Plot sin(x) on the interval [-2pi, 2pi] using 0.01 spacing. Plot the function with a solid line and the derivative with a dashed line. Add a legend and label the axes and determine how many times their graph intersect.

PROGRAM CODE:

```
x = [-2*pi : 0.01 : 2*pi];
y = sin(x);

y_derivative = cos(x);

plot(x, y, '-b');
hold on;

plot(x, y_derivative, '--r');

title('Graph Of Sin(x) And Its Derivative Using Matlab CA1 1a')
xlabel('x - axis'); ylabel('y - axis');
legend('f(x) = sin(x)',"f'(x) = cos(x)");
```

OUTPUT:



1. B)

Create the following matrix

X = [2 4 6 8 10

3 6 9 12 15

7 14 21 28 35]

PROGRAM CODE :

```
X = [2:2:10; 3:3:15; 7:7:35];
X1 = X(2,:);

X2 = X(:, 4);

First_Row = X(1, :);
Second_Row = X(2, :);
X3 = [First_Row Second_Row];
```

```
Second_Column = X(: ,2);
Fifth_Column = X(:, 5);
X4 = [Second_Column; Fifth_Column];

First_Column = X(: ,1);
Third_Column = X(: ,3);
Fourth_Column = X(: ,4);
X5 = [First_Column, Third_Column, Fourth_Column];

disp(X);
disp(X1);
disp(X2);
disp(X3);
disp(X4);
disp(X5);
```

OUTPUT: