Math 244: MATLAB Assignment 1

Name:

RUID:

Date:

```
clear;
close all;
clc;
```

1.

```
% Define variables and computations here
x = 6
```

```
x = 6
```

```
y = 5
```

```
y = 5
```

```


xy = x * y
```

```
xy = 30
```

```
squares = x^2 + y^2
```

```
squares = 61
```

```
div = x / (3 * y)
```

```
div = 0.4000
```

2.

```
% Display commands here
disp(['The number x is ' num2str(x) '.']);
```

```
The number x is 6.
```

```
disp(['The number y is ' num2str(y) '.']);
```

```
The number y is 5.
```

```
disp(['The product xy is ' num2str(xy) '.']);
```

```
The product xy is 30.
```

3.

```
% Generates a random number between 1 and 100
```

```
randNum = randi(100, 1)
```

```
randNum = 96
```

```
% Write the if statements here
if mod(randNum, 2) == 0
    disp(['The number ' num2str(randNum) ' is even.']);
else
    disp(['The number ' num2str(randNum) ' is odd.']);
end
```

```
The number 96 is even.
```

```
```

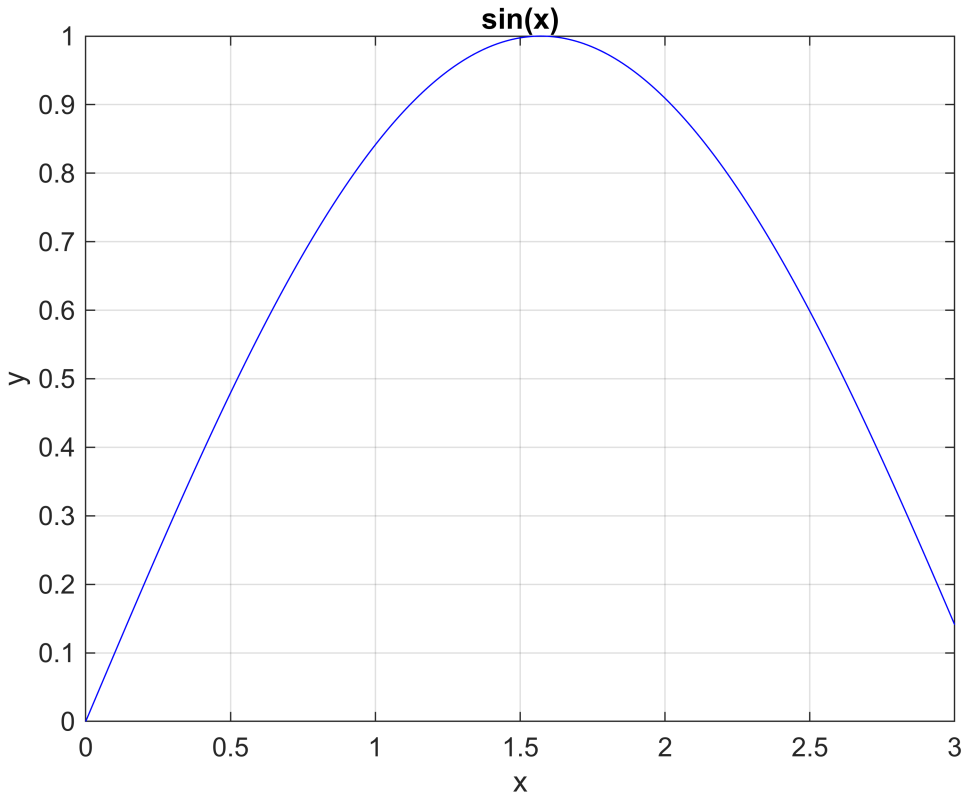
4.

```
% Define a vector that will contain the Fibonacci numbers
fibonacci = zeros(1, 20);

% Initial conditions
fibonacci(1) = 1;
fibonacci(2) = 1;

% Write the for loop here
for i = 3:20
    fibonacci(i) = fibonacci(i-1) + fibonacci(i-2);
end

% Display the vector
disp(fibonacci);
```

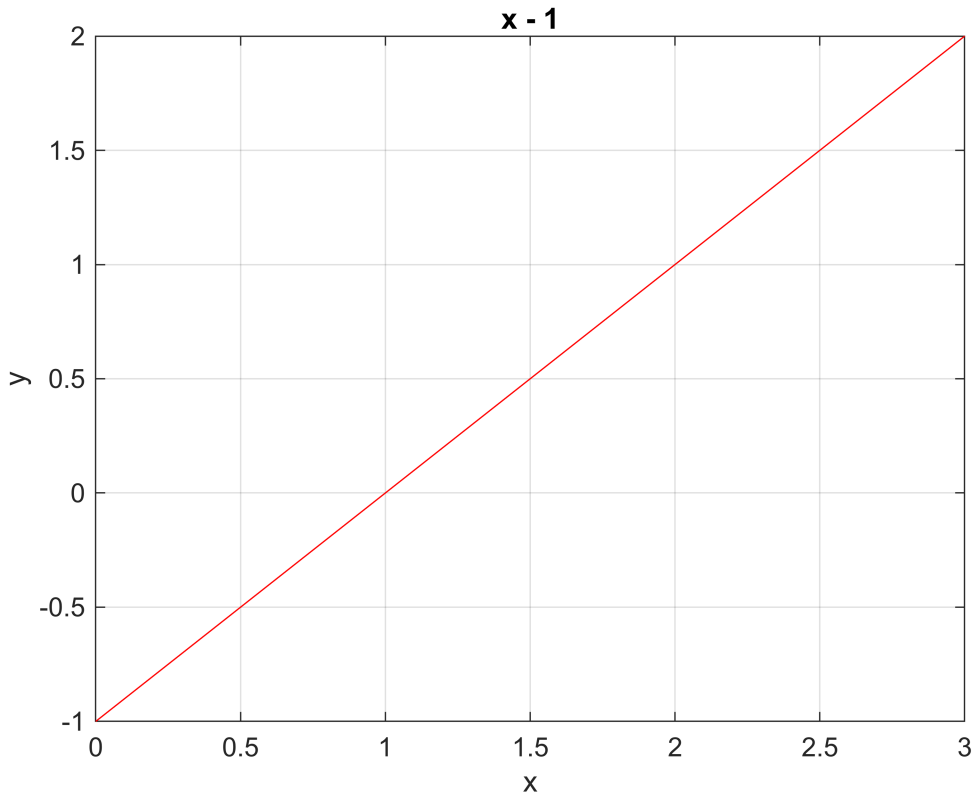
```
     1     1     2     3     5     8    13    21    34
```

5.

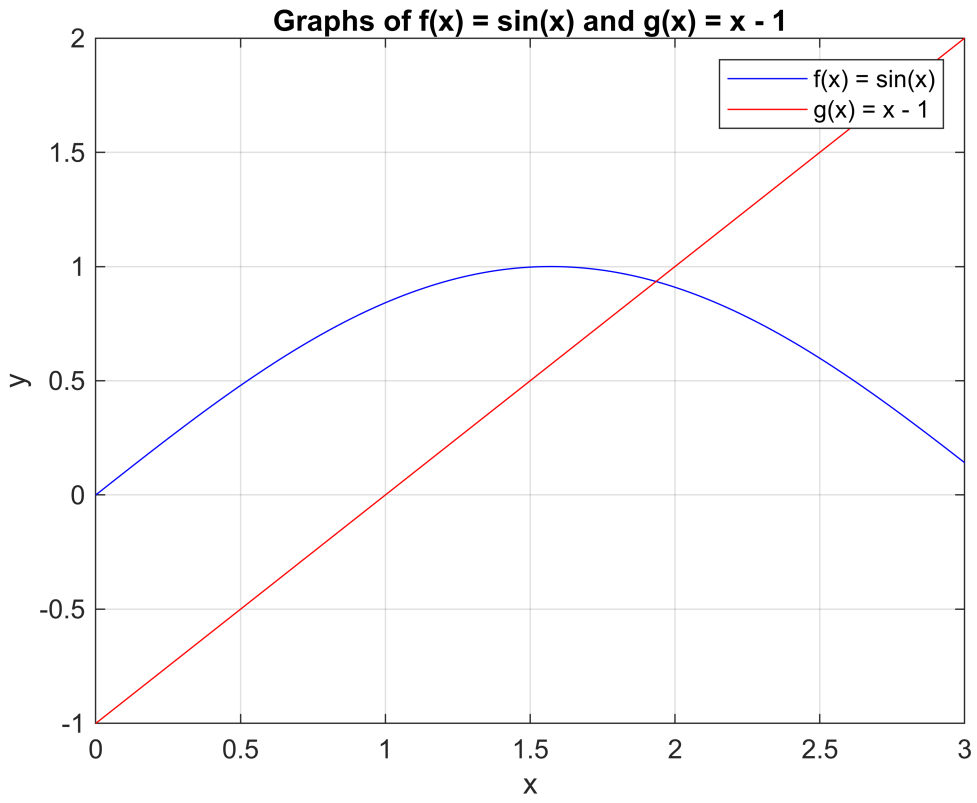
```
xVals = linspace(0, 3, 1000);

% Define the functions f and g
f = @(x) sin(x);
g = @(x) x - 1;

% Plot the graph of f
figure();
plot(xVals, f(xVals), 'b');
title('sin(x)');
xlabel('x');
ylabel('y');
grid on;
```




```
% Plot the graph of g
figure();
plot(xVals, g(xVals), 'r');
title('x - 1');
xlabel('x');
ylabel('y');
grid on;
```



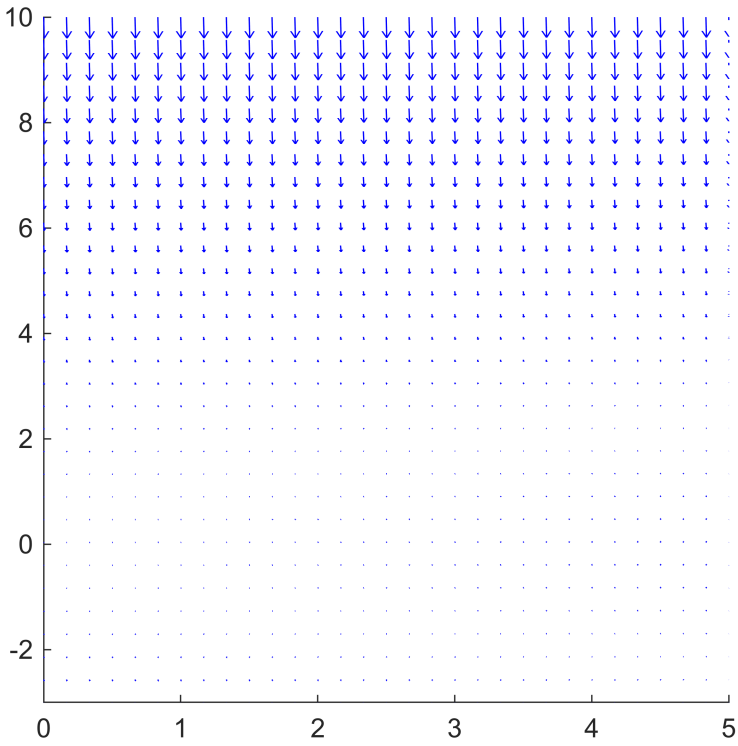

```
% Plot the graph of f and g together
figure();
plot(xVals, f(xVals), 'b');
hold on;
plot(xVals, g(xVals), 'r');
title('Graphs of f(x) = sin(x) and g(x) = x - 1');
xlabel('x');
ylabel('y');
legend('f(x) = sin(x)', 'g(x) = x - 1');
grid on;
hold off;
```

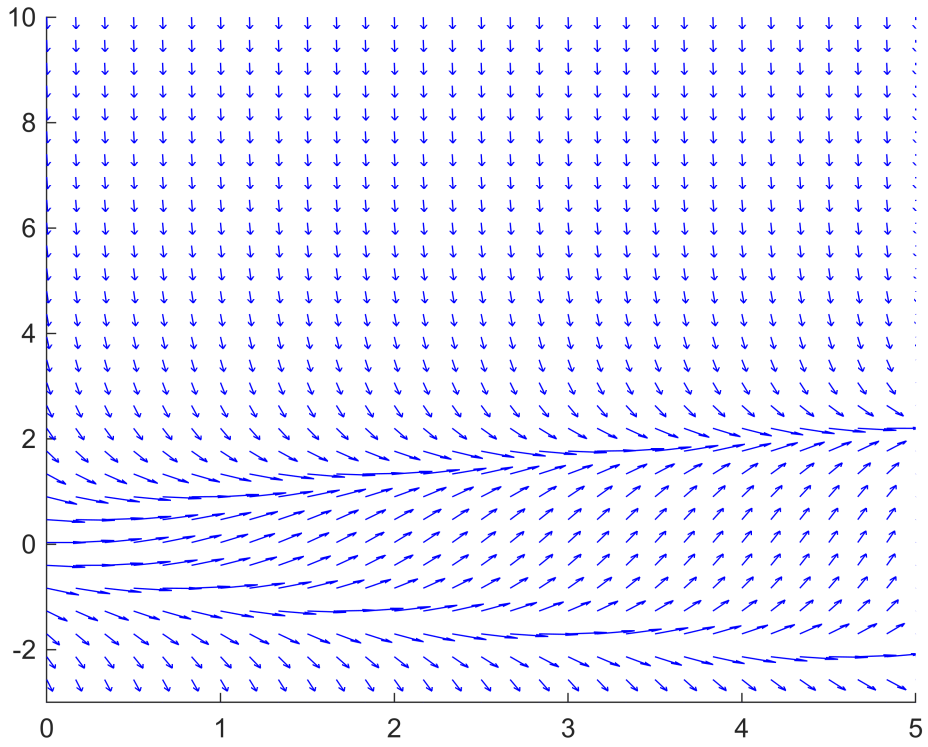



```
clf;
```

6.

```
% Define function and use quiver244 here.
h = @(t, y) t - y.^2;
t_min = 0;
t_max = 5;
y_min = -3;
y_max = 10;
col = 'b';
quiver244(h, t_min, t_max, y_min, y_max, col);
```






```
% If we start with y(0) = 3, the solution would decrease as y gets bigger.
% If we start with y(0) = 0, the solution would be flat at first since the
% slope is 0.
```

```
% If we start with y(0) = 8, the solution would rapidly decrease as y gets bigger.
```

7.

```
% Code for sample plots here
g = @(t, y) t - y.^2;
t_min = 0;
t_max = 5;
y_min = -3;
y_max = 10;
t_0 = 0;
y_0 = 0;
col = 'r';
samplePlots244(g, t_min, t_max, y_min, y_max, t_0, y_0, col);
```