Questions 2-6

(2)

```
pi_power_term = @(index) (-3)^(-index) / (2 * index + 1);

current_estimate = 1;
current_sum = 0;
k = 0;
last_term = 1;

while abs(last_term / current_estimate) >= 10 ^ -8
    last_term = pi_power_term(k);
    current_sum = current_sum + pi_power_term(k);
    k = k + 1;
    current_estimate = sqrt(12) * current_sum;
end

fprintf('Pi estimation: %.8f\n', current_estimate)
```

(3)

```
%% making data and graph
x_values = 0:0.02:3.14;
y_values = sin(x_values);

disp(y_values)

sin_line = plot(x_values, y_values);

%% adding labels
xlabel('x values')
ylabel('y values')
title('y = sin(x)')
```

(4)

```
x_values = 0:0.02:3.14;
sin_values = sin(x_values);
cos_values = cos(x_values);

sin_line = plot(x_values, sin_values);
hold on;
cos_line = plot(x_values, cos_values);

xlim([0, 3.14])

xlabel('x values')
ylabel('y values')
title('y = sin(x) and y = cos(x)')
legend('y = sin(x)', 'y = cos(x)')
```

(5)

```
syms x

f = x ^ 2 + 9 * x + 8;
factored_f = factor(f);

disp(factored_f)
```

(6)

```
syms a b x

f = 1 / (a^2 + b^2 * x^2);

dfdx = int(f, x);

disp(dfdx)
```