Worksheet 3:

Problem 1:

```
z = function0(10)
```

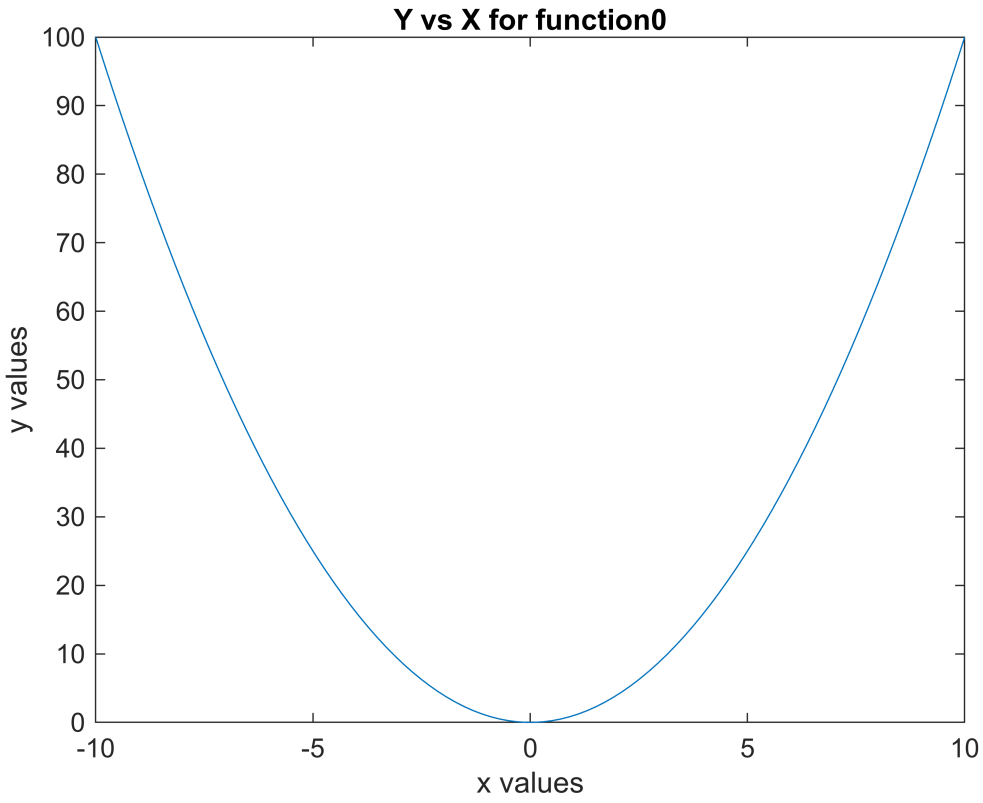
```
z = 100
```

Problem 2:

```
% Part a
% I defined function0 using x.*x in order to make sure the vector multiplication
works out
figure()
x = linspace(-10,10,100);
plot(x,function0(x))

% Part b
xlabel('x values')
ylabel('y values')

% Part c -- graph of a parabola centered at origin
title('Y vs X for function0')
```



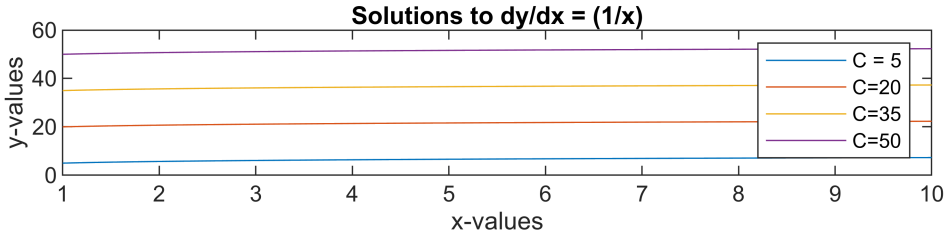
Problem 3:

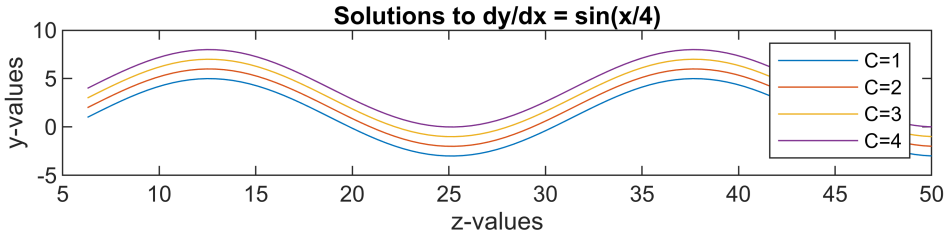
```
% part a
```

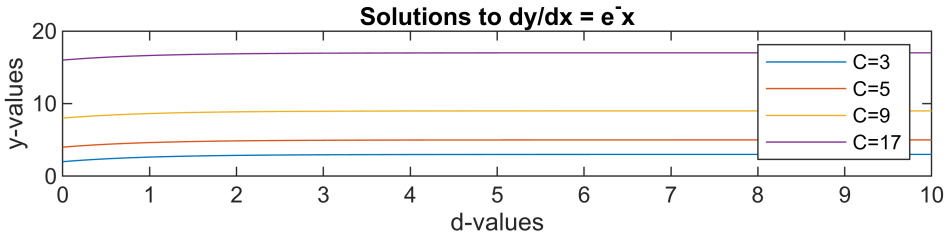
```
f_0 = @(t,c) log(abs(t)) + c;
x = linspace(1,10,100);
subplot(3,1,1)
plot(x,f_0(x,5))
hold on
plot(x,f_0(x,20))
plot(x,f_0(x,35))
plot(x, f_0(x,50))
hold off
xlabel('x-values')
ylabel('y-values')
title('Solutions to dy/dx = (1/x)')
legend('C = 5','C=20','C=35','C=50')

% part b
% note I am renaming the x-axis to the y-axis for this plot and replacing x with
y just to avoid any confusion in the programing across my different plots between
parts a, b, and c
f_1 = @(t,c) -4*cos(t/4) + c;
y = linspace(2*pi,50,100);
subplot(3,1,2)
plot(y,f_1(y,1))
hold on
plot(y,f_1(y,2))
plot(y,f_1(y,3))
plot(y,f_1(y,4))
hold off
xlabel('z-values')
ylabel('y-values')
title('Solutions to dy/dx = sin(x/4)')
legend('C=1','C=2','C=3','C=4')

% part c
% note I am renaming the x-axis to the z-axis for this plot and replacing x with
z just to avoid any confusion in the programing across my different plots between
parts a, b, and c
f_2 = @(t,c) -1*exp(-t) + c;
z = linspace(0,10,100);
subplot(3,1,3)
plot(z,f_2(z,3))
hold on
plot(z,f_2(z,5))
plot(z,f_2(z,9))
plot(z,f_2(z,17))
hold off
xlabel('d-values')
ylabel('y-values')
title('Solutions to dy/dx = e^-x')
legend('C=3','C=5','C=9','C=17')
```


Solutions to dy/dx = (1/x)
y-values
x-values
C = 5
C=20
C=35
C=50


Solutions to dy/dx = sin(x/4)
y-values
z-values
C=1
C=2
C=3
C=4


Solutions to dy/dx = e^-x
y-values
d-values
C=3
C=5
C=9
C=17