Exercise:

1. Calculate for $\left(1+\frac{2}{n^2}\right)^n$ n= 3, 7.

Code:

```
n= 3
func = power((1 + (2./(n*n))),n)

n=7
func = power((1 + (2./(n*n))),n)
```

Output:

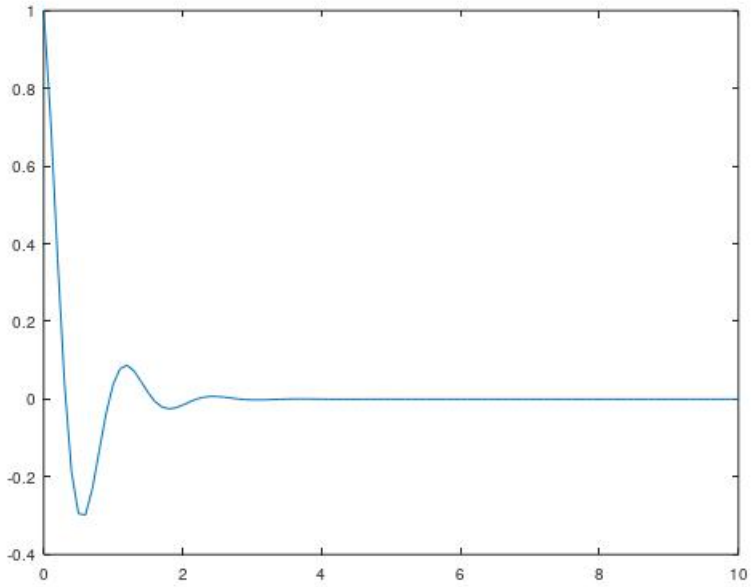
```
>> n = 3
func = 1.8258
n = 7
func = 1.3232
```

2. Plot the function: $y = e^{-at}*\cos(\omega t)$, for a = 2, ω= 5, and t = 0-10.

Code:

```
a = 2;
w = 5;
t = 0:0.1:10;
func = exp(-a*t).*cos(w*t);
xlabel('t');
ylabel('y');
plot(t,func);
```

Output:



3. Try using the WHILE and the IF statements to calculate all the Fibonacci numbers sothat the sum of two consecutive numbers is smaller than 10,000. How many are even?How many are odd? Try to plot them.

Code:

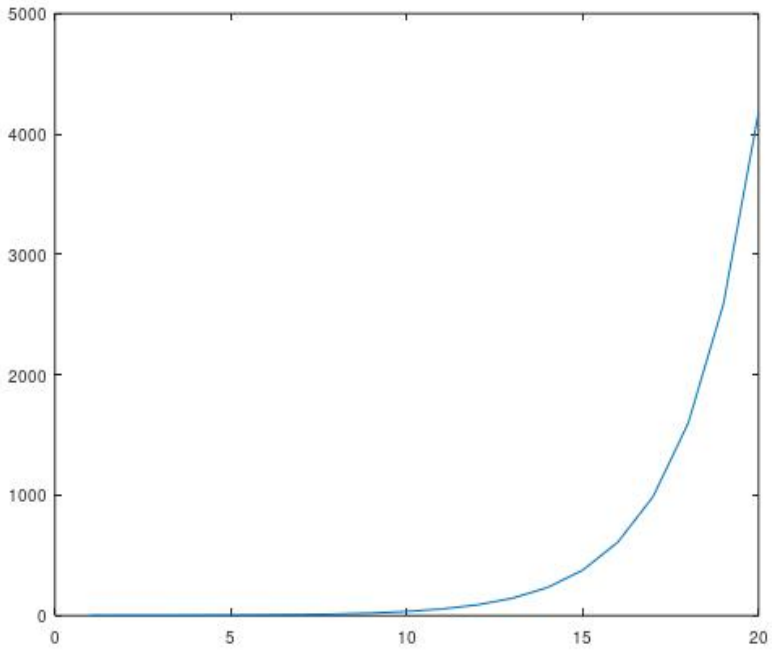
```
num(1)=0;
num(2)=1;
temp=3;
num(temp)=0;
even=1;
odd=0;
fprintf('%d\n',num(1));
while((num(temp-2)+num(temp-1))<10000)
 if rem(num(temp-1),2)==0
  even += 1;
 else
  odd += 1;
 end
 fprintf('%d\n',num(temp-1));
 num(temp)=num(temp-2)+num(temp-1);
 temp=temp+1;
```

```
end

fprintf("Even number total counts: %d\n",even);
fprintf("odd number total counts: %d\n",odd);
result = num(1:temp-2);
plot(result);
```

Output:

```
>> 0
1
1
2
3
5
8
13
21
34
55
89
144
233
377
610
987
1597
2584
4181
Even number total counts: 7
odd number total counts: 13
```



4. Given $f(x)= (x^2+2x+3)/(x+3)$.Plot f(x) for 0<=x<=100

Code:

```
x=0:0.1:100;
fx=(x.*x + 2*x + 3)./(x + 3);
xlabel('x');
ylabel('f(x)');
plot(x,fx);
```

Output: