PART I: GIVEN

1. Find the root of the following polynomial function using the secant method:

   $x^3 - 4x - 9$.

2. Find the root of the following polynomial function using the secant method:

   $x^3 - 4$.

3. Find the root of the following polynomial function using the secant method:

   $x^3 - 3$.

4. Find the root of the following polynomial function using the secant method:

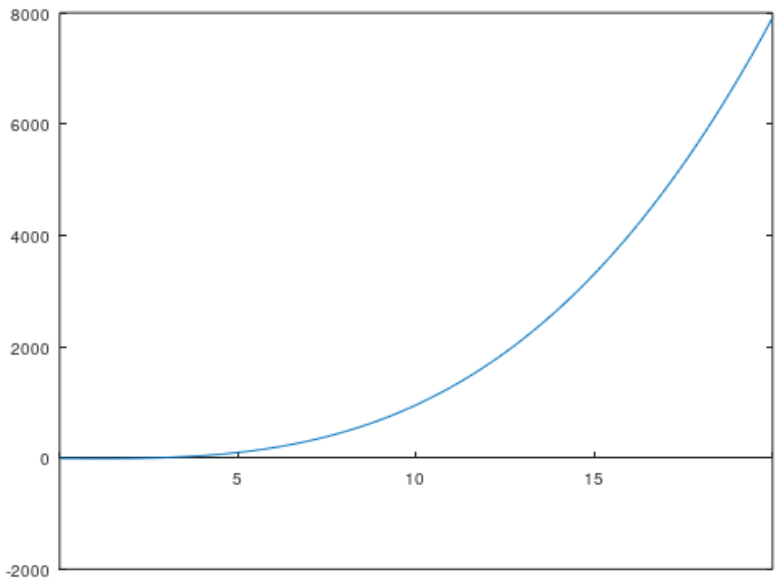
   $x^3 - 3x - 5$.

5. Find out after how many iterations the function $x^4 - x^3 - x^2 - 4$ in the interval [1, 9].

PART II: SCREENSHOT OF THE OUTPUTS IN GUI OCTAVE

PROGRAM 1

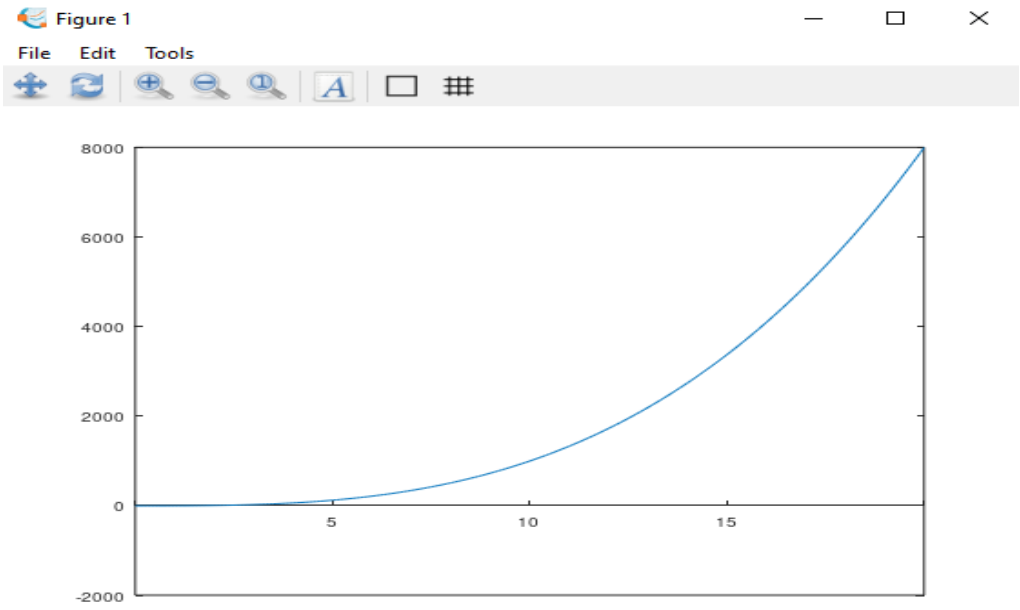
```
clear; clc; close all;

f = @(x) x.^3-4*x-9;

xq=0:0.1:20;
plot(xq,f(xq));
set(gca,'xAxisLocation','origin')

a =2; b = 3;

c = (a*f(b) - b*f(a))/(f(b) -f(a));

tol = 1e-6;
counter = 0;
while abs(f(c)) > tol
  a = b;
  b = c;

  c = (a*f(b) - b*f(a))/(f(b) -f(a));
  counter = counter + 1;

end
```



Name	Class	Dimension	Value	Attribute
a	double	1x1	2.7072	
b	double	1x1	2.7065	
c	double	1x1	2.7065	

PROGRAM 2

```
clear; clc; close all;

f = @(x) x.^3-4

xq=0:0.1:20;
plot(xq,f(xq));
set(gca,'xAxisLocation','origin')

a =1.; b = 2;

c = (a*f(b) - b*f(a))/(f(b) -f(a));

tol = 1e-6;
counter = 0;
while abs(f(c)) > tol
  a = b;
  b = c;

  c = (a*f(b) - b*f(a))/(f(b) -f(a));
  counter = counter + 1;

end
```

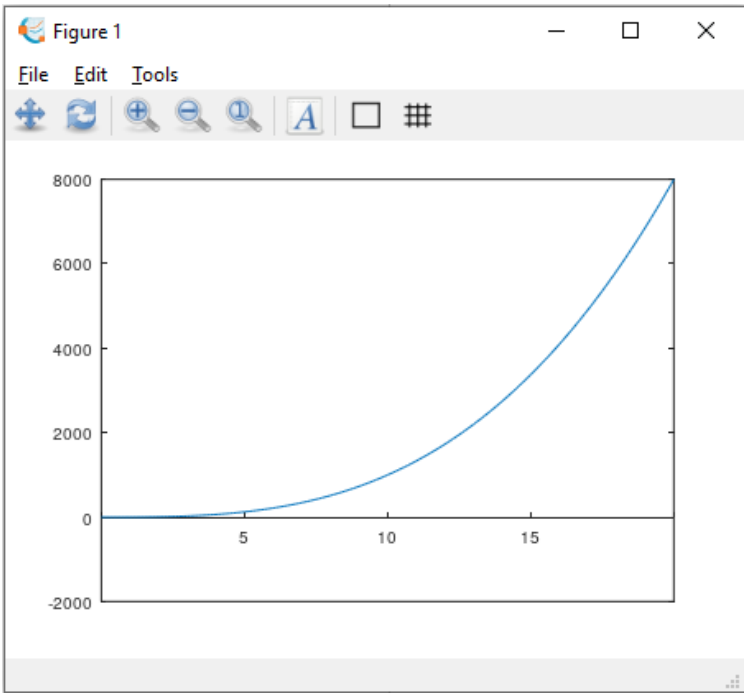


Name	Class	Dimension	V
a	double	1x1	1.5873
b	double	1x1	1.5874
c	double	1x1	1.5874

PROGRAM 3

SecantProgNum3.m

```
1  clear; clc; close all;
2
3  f = @(x) x.^3 - 3;
4
5  xq=0:0.1:20;
6  plot(xq,f(xq));
7  set(gca,'xAxisLocation','origin')
8
9  a =1; b = 2;
10
11 c = (a*f(b) - b*f(a))/(f(b) -f(a));
12
13 tol = 1e-6;
14 counter = 0;
15 while abs(f(c)) > tol
16    a = b;
17    b = c;
18
19    c = (a*f(b) - b*f(a))/(f(b) -f(a));
20    counter = counter + 1;
21
22 end
```

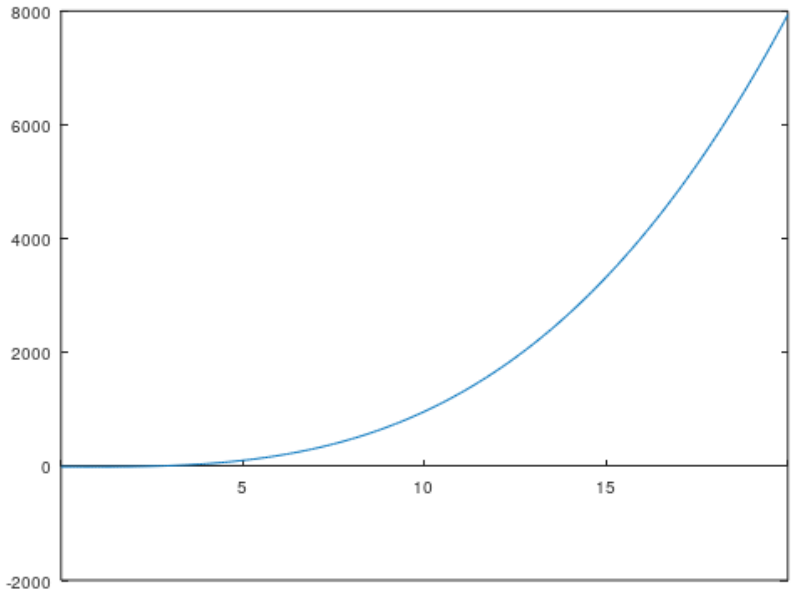


Name	Class	Dimension	Value	Attribute
a	double	1x1	1.4420	
b	double	1x1	1.4422	
c	double	1x1	1.4422	

PROGRAM 4

secant1.m

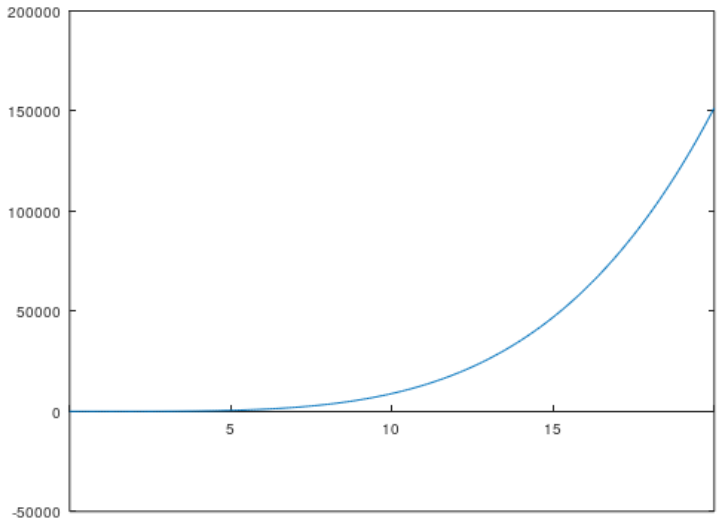
```
clear; clc; close all;

f = @(x) x.^3-3*x -5;

xq=0:0.1:20;
plot(xq,f(xq));
set(gca,'xAxisLocation','origin')

a =0.05; b = 0.02;

c = (a*f(b) - b*f(a))/(f(b) -f(a));

tol = 1e-6;
counter = 0;
while abs(f(c)) > tol
  a = b;
  b = c;

  c = (a*f(b) - b*f(a))/(f(b) -f(a));
  counter = counter + 1;

endS
```



Name	Class	Dimension	Value	Attribute
a	double	1x1	2.2776	
b	double	1x1	2.2790	
c	double	1x1	2.2790	

PROGRAM 5

```
clear; clc; close all;

f = @(x) x.^4-x.^3-x.^2-4;

xq=0:0.1:20;
plot(xq,f(xq));
set(gca,'xAxisLocation','origin')

a =1; b = 9;

c = (a*f(b) - b*f(a))/(f(b) -f(a));

tol = 1e-6;
counter = 0;
while abs(f(c)) > tol
  a = b;
  b = c;

  c = (a*f(b) - b*f(a))/(f(b) -f(a));
  counter = counter + 1;

end
```



Name	Class	Dimension	Value	Attribute

The secant method does not converge.
Initial values [1, 9] are too far from the root.