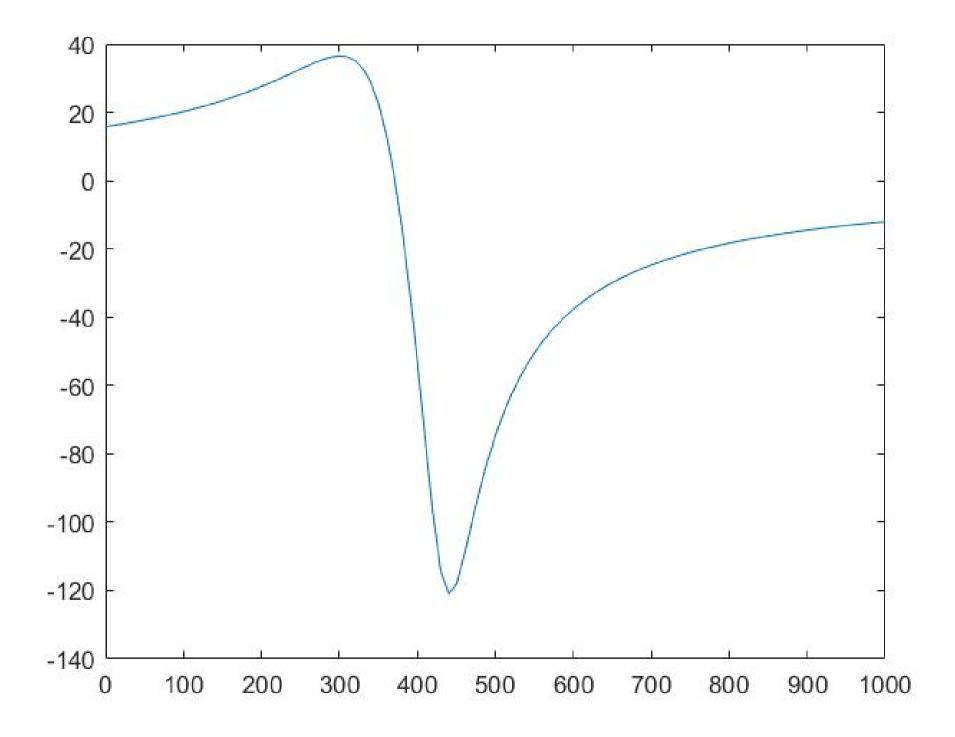
NAME: Utkarsh Jaiswal

ROLL NO: 18EX20030

Lab Assignment

```
2 🔘
      clear all
      close all
 3 -
 4 -
       clc
      xi=linspace(0,1000,101);
 5 -
 6 -
      h=50;
 7 -
      k=50;
 8 -
       a=40;
9 -
      al=30*pi/180; xo=400;
10 -
      V=k*\log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
11 -
      plot(xi,V)
```

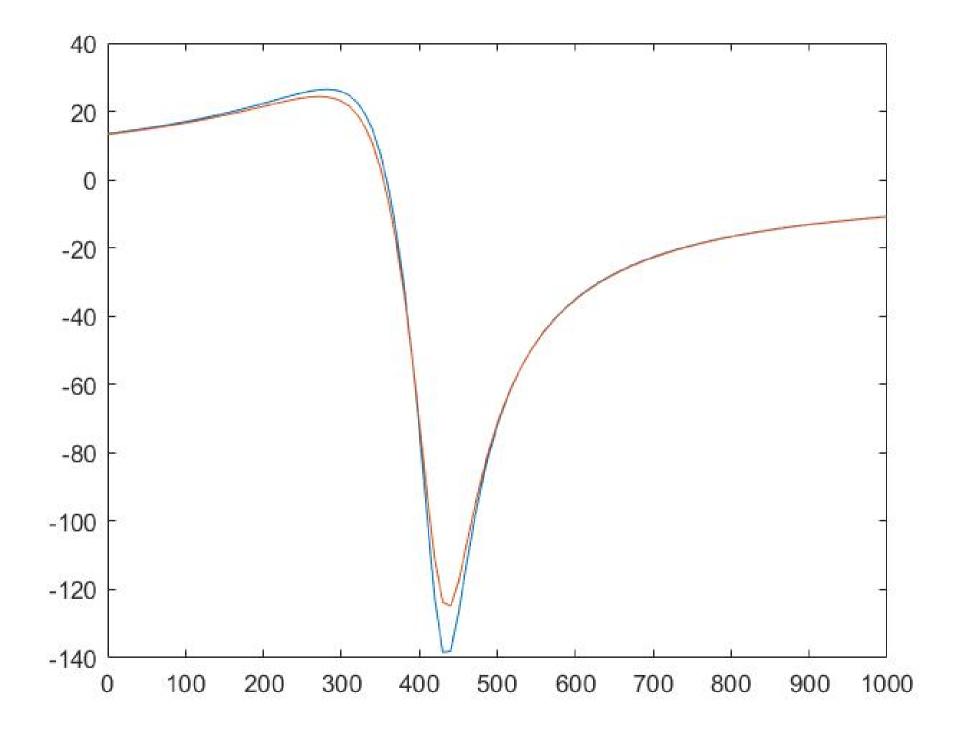
%18EX20030 UTKARSH JAISWAL



```
%18EX20030 UTKARSH JAISWAL
       clear all
       close all
       clc
       xi=linspace(0,1000,101);
       h=50;
       k=50;
       a = 40;
 9 -
       al=(40*pi)/180;
10 -
       xo = 400;
11 -
       Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
12 -
       plot(xi, Vi)
13 -
       hold on;
14 -
       h=55;
15 -
       k=50;
16 -
       a = 40;
17 -
       al=(40*pi)/180;
18 -
       xo = 400;
19 -
       Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
20 -
       plot(xi, Vnew)
21 -
       s=0;
22 - \Box for i = 1:length(xi)
23 -
           s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
24 - end
25 - misfiterror=100*((s/length(xi))^0.5)
```

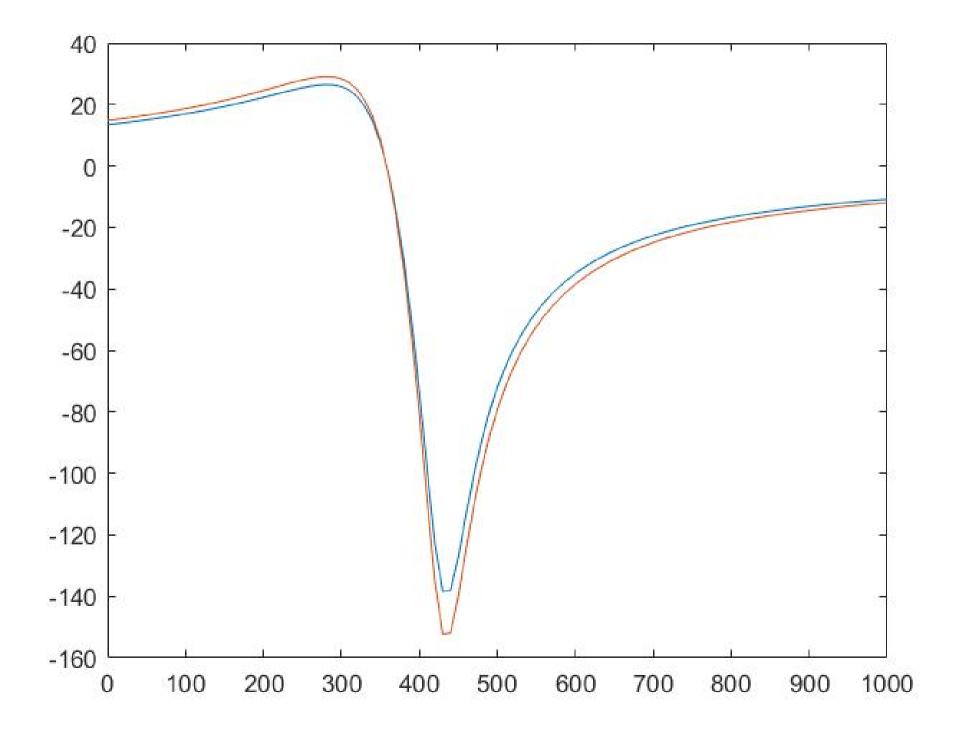
Command Window mistiterror =

10.4149



```
%18EX20030 UTKARSH JAISWAL
        clear all
        close all
 4 -
        clc
 5 -
        xi=linspace(0,1000,101);
 6 -
        h=50;
 7 -
        k=50;
 8 -
        a = 40;
        al=(40*pi)/180;
 9 -
10 -
        xo=400;
11 -
        Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
12 -
        plot(xi, Vi)
13 -
        hold on;
14 -
        h=50;
15 -
        k=55;
16 -
        a = 40;
17 -
        al=(40*pi)/180;
18 -
        xo=400;
19 -
        V_{\text{new}} = k^* \log (((((x_i - x_0) - (a^* \cos(al))) \cdot ^2) + ((h_a^* \sin(al)) \cdot ^2)) \cdot / ((((x_i - x_0) + (a^* \cos(al))) \cdot ^2) + ((h_a^* \sin(al)) \cdot ^2)));
20 -
        plot(xi, Vnew)
21 -
        s=0;
22 - ☐ for i = 1:length(xi)
23 -
            s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
24 - end
       misfiterror=100*((s/length(xi))^0.5)
25 -
```

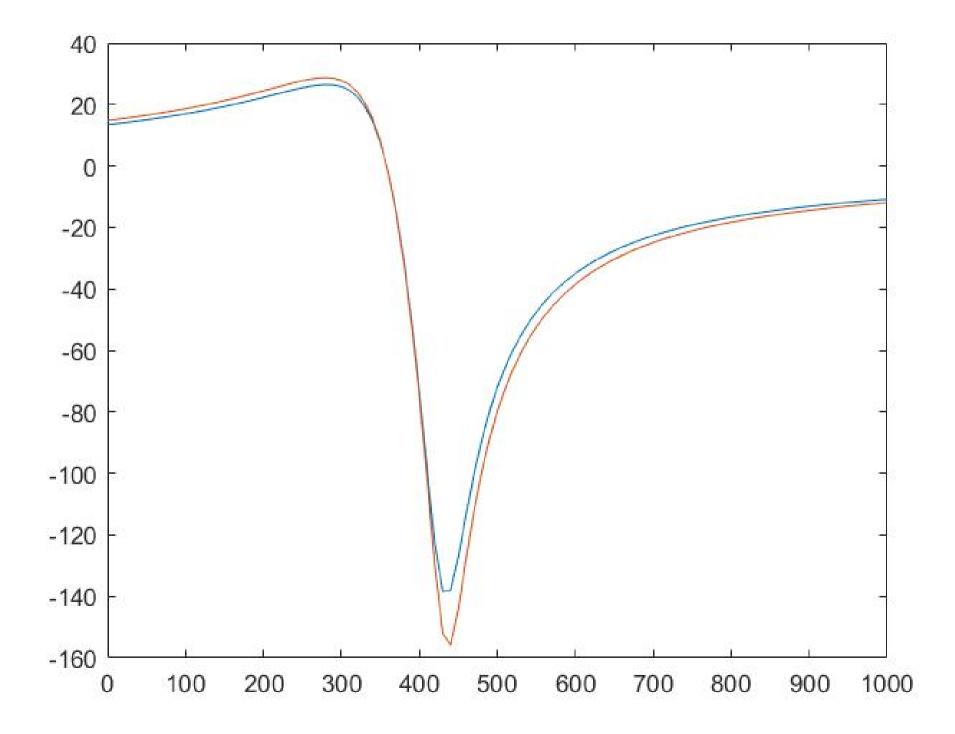
```
Command Window
mistiterror =
3.6999
```



```
%18EX20030 UTKARSH JAISWAL
       clear all
 3 -
       close all
 4 -
       clc
       xi=linspace(0,1000,101);
       h=50;
 7 -
       k=50;
 8 -
       a = 40;
       al=(40*pi)/180;
 9 -
10 -
       xo = 400;
11 -
       Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
12 -
       plot(xi, Vi)
13 -
       hold on;
14 -
       h=50;
15 -
       k=50;
       a=44;
16 -
17 -
       al=(40*pi)/180;
18 -
       xo=400;
19 -
       Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
20 -
       plot(xi, Vnew)
21 -
       s=0;
22 - 🗏 for i = 1:length(xi)
23 -
           s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
24 - end
       misfiterror=100*((s/length(xi))^0.5)
25 -
```

```
Command Window
misfiterror =
```

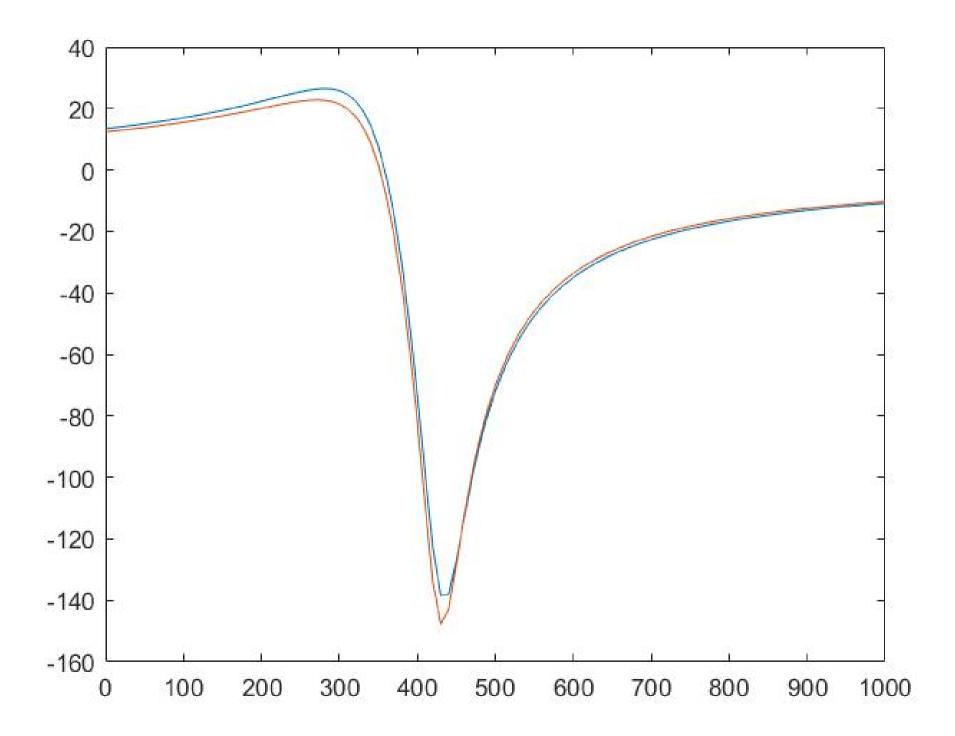
3.4705



```
%18EX20030 UTKARSH JAISWAL
       clear all
       close all
4 -
       clc
       xi=linspace(0,1000,101);
       h=50;
       k=50;
8 -
       a = 40;
       al=(40*pi)/180;
10 -
       xo = 400;
       Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./(((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2));
11 -
12 -
       plot(xi, Vi)
13 -
       hold on;
14 -
       h=50;
15 -
       k=50;
16 -
       a = 40;
17 -
       al=(40*pi)/180+10/100*(40*pi)/180;
18 -
19 -
       Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
20 -
       plot(xi, Vnew)
21 -
       s=0;
22 - \Box for i = 1: length(xi)
           s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
23 -
24 -
      misfiterror=100*((s/length(xi))^0.5)
```

Command Window

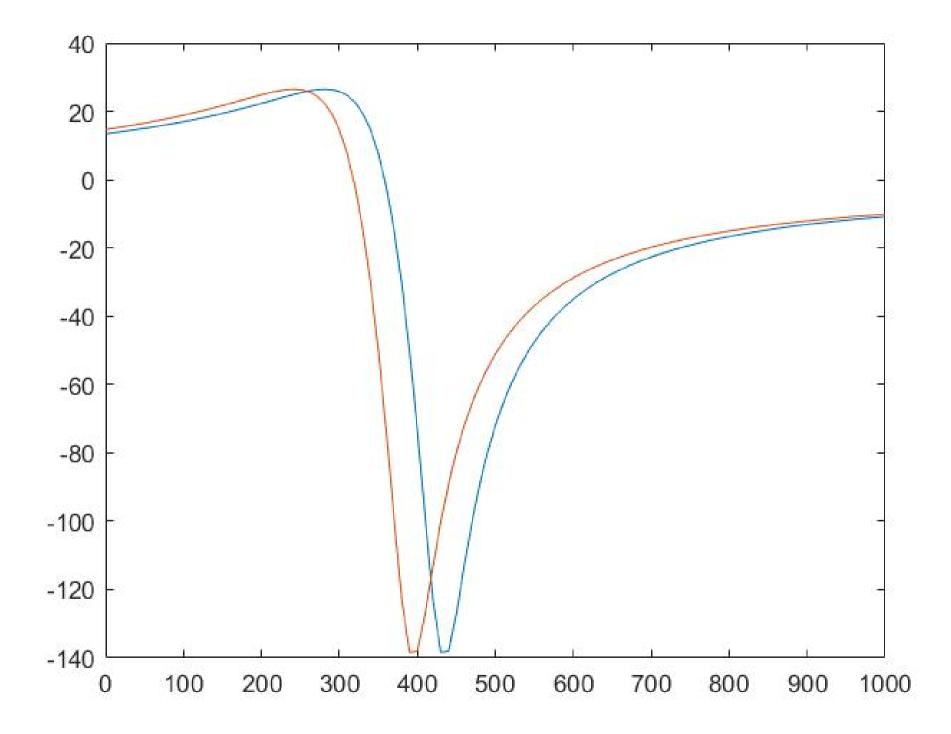
misfiterror = 12.8295



```
1
        %18EX20030 UTKARSH JAISWAL
 2 -
        clear all
 3 -
        close all
        clc
 4 -
        xi=linspace(0,1000,101);
        h=50;
        k=50;
 7 -
 8 -
        a = 40;
        al=(40*pi)/180;
 9 -
10 -
        xo=400;
11 -
        Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2));
12 -
        plot(xi, Vi)
13 -
        hold on;
14 -
        h=50;
15 -
        k=50;
16 -
        a = 40;
17 -
        al=(40*pi)/180;
18 -
        xo=360;
        V_{\text{new}} = k \log (((((x_i - x_0) - (a \cos(al))) \cdot ^2) + ((h - a \sin(al)) \cdot ^2)) \cdot / ((((x_i - x_0) + (a \cos(al))) \cdot ^2) + ((h + a \sin(al)) \cdot ^2)));
19 -
20 -
        plot(xi, Vnew)
21 -
        s=0;
22 -  for i = 1:length(xi)
23 -
            s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
24 -
25 - misfiterror=100*((s/length(xi))^0.5)
Command Window
```

misfiterror =

41.8983



Observation:

We observe that except 'h' all other parameters have almost same error so 'h' can be assumed to be the important parameter as it is varying a lot when its value is changed