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ROLL NO: 18EX20030

Lab Test

```
%18EX20030 UTKARSH JAISWAL
clear all
close all
clc
%below given values are of column A
X=[1, 1.5, 2, 3, 5, 7, 10, 15, 20, 30, 50, 70, 100, 150, 200, 300, 500, 700, 1000];
%below given values are of column V
given=[191,190.99,190.99,190.97,190.72,190.07,188.14,181.96,172.02,144.17,87.22,52.95,33.02,26.16,25.02,24.55,24.35,24.21,24.01];
plot(X,given,'o')
hold on;
h= 22;
p1 = 190;
p2=24;
K = (p2 - p1)/(p2 + p1);
for i = 1:length(X)
d = X(i)/h;
s =0;
for n = 1:2000
s = s + (((d^3)*(K^n))/((d^2 + 4*(n)^2)^(1.5)));
end
```

Command Window

```
final =

    0.4886


initial =

   12.6477
```

```
    s = s + (((d^3)*(K^n))/((d^2 + 4*(n)^2)^(1.5)));
    end
    calculated(i) = p1*(1 + 2*s);
    end
    loglog(X,calculated);
    err=0;
    for i = 1:length(X)
     err=err+((given(i)-calculated(i))/given(i))^2;
    end
    final=100*((err/length(X))^0.5)
    h= 24;
    p1 = 178;
    p2=28;
    K = (p2 - p1)/(p2 + p1);
    for i = 1:length(X)
    d = X(i)/h;
    s =0;
    for n = 1:2000
    s = s + (((d^3)*(K^n))/((d^2 + 4*(n)^2)^(1.5)));
    end
```

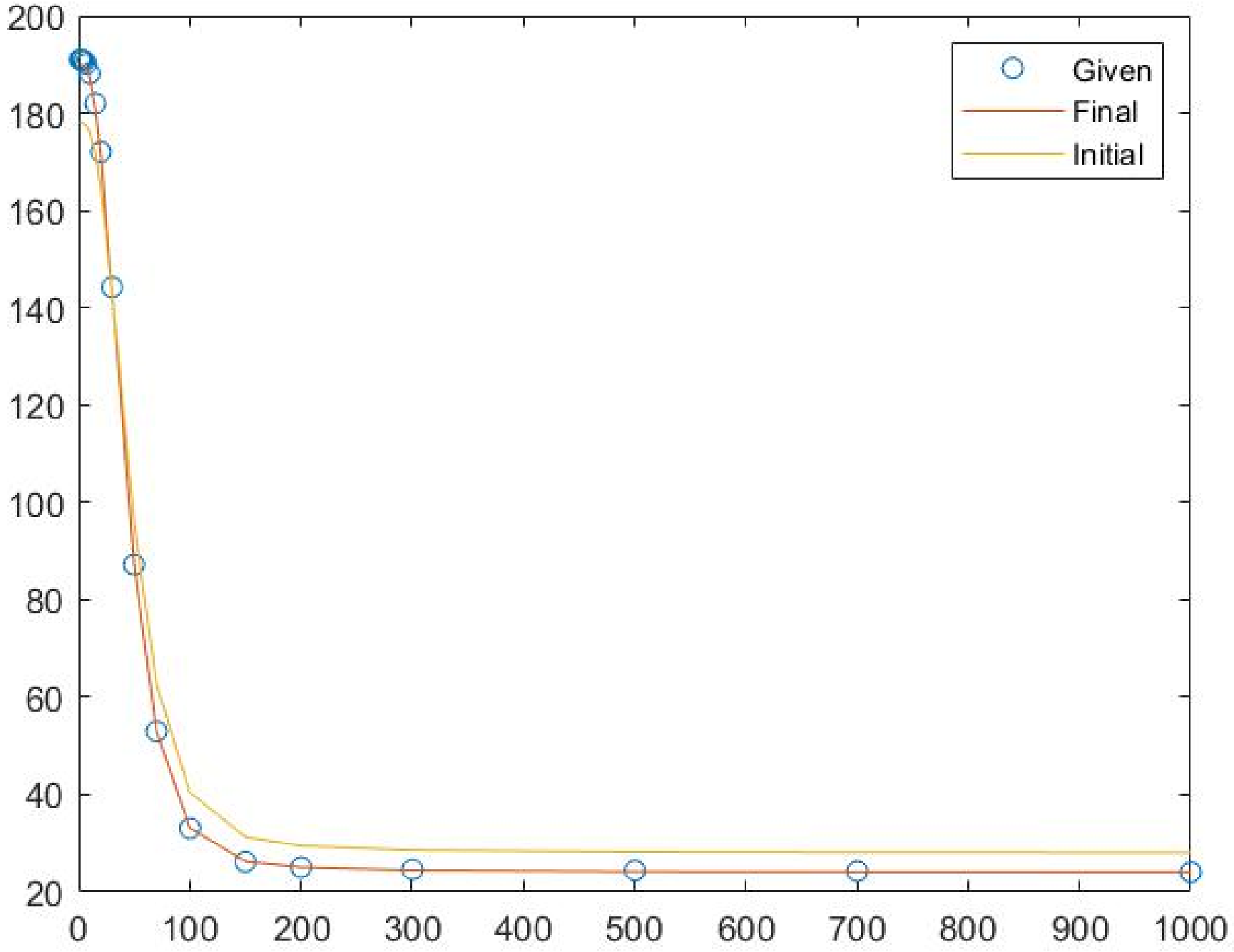
Command Window

```
final =

    0.4886


initial =

   12.6477
```

```
35 -    s =0;
36 -   for n = 1:2000
37 -    s = s + (((d^3)*(K^n))/((d^2 + 4*(n)^2)^(1.5)));
38 -    end
39 -    calculated(i) = p1*(1 + 2*s);
40 -    end
41 -    loglog(X,calculated);
42 -    err=0;
43 -   for i = 1:length(X)
44 -     err=err+((given(i)-calculated(i))/given(i))^2;
45 -    end
46 -    initial=100*((err/length(X))^0.5)
47 -    legend('Given ','Final ','Initial')
48
49 -    fprintf('Table\n');
50 -    fprintf('Parameters      Initial         Final\n');
51 -    fprintf('h               24                22\n');
52 -    fprintf('P1              178              190\n');
53 -    fprintf('P2              28                24\n');
54 -    fprintf('Misfit error    12.6477        0.4886\n');
```

Command Window

```
   12.6477

Table
Parameters      Initial         Final
h               24                22
P1              178              190
P2              28                24
Misfit error    12.6477        0.4886
>>
```


200
180
160
140
120
100
80
60
40
20
0
100
200
300
400
500
600
700
800
900
1000
Given
Final
Initial

Parameter	Initial	Final
h	24	22
p1	178	190
p2	28	24
Misfit error	12.6477	0.4886

The column given to me was V

I chose the following values because

- The initial is half of the infexion point since with the depth of Schlumberger penetration Is less than $1/4^{th}$ of the initial distance between the two electrodes C1 and C2
- Due to very small value of r it will be approximately equal to rho1 and rho2 and will be approximately equal to the saturating value