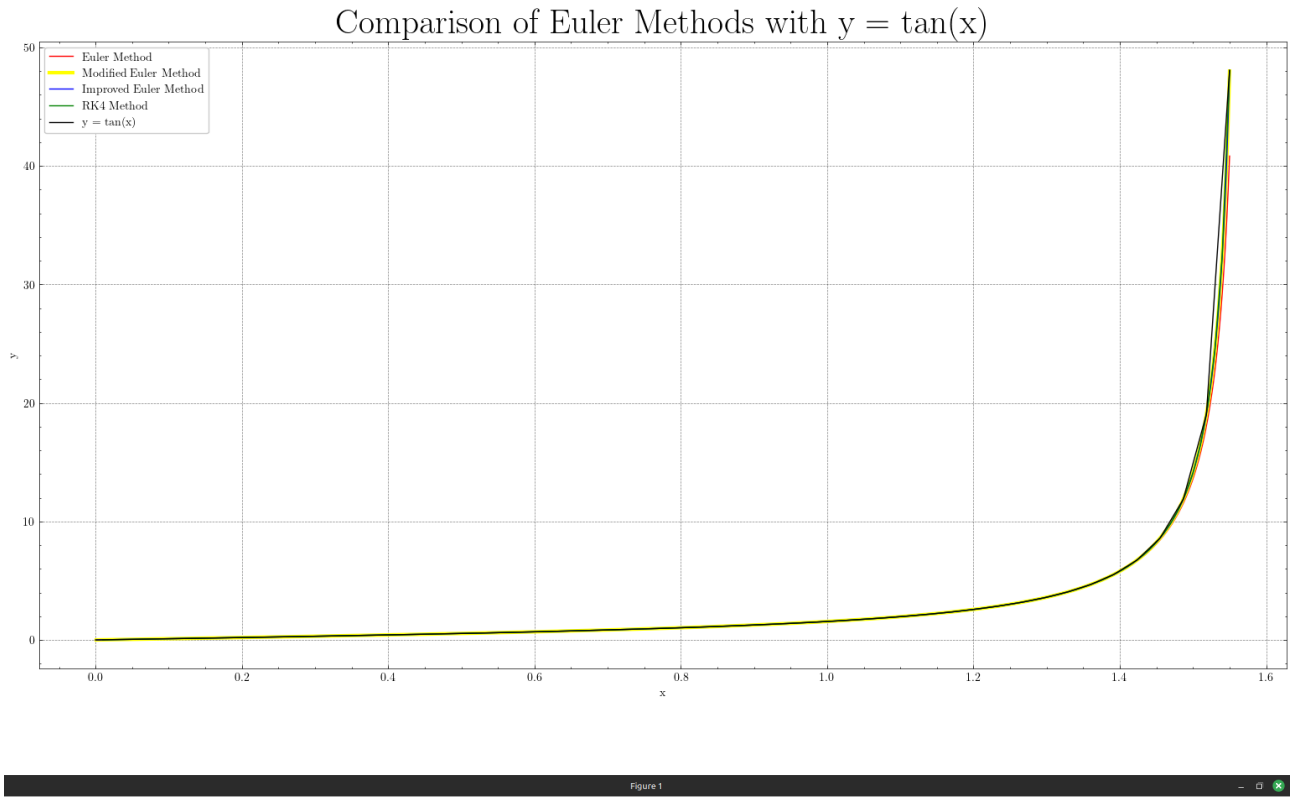
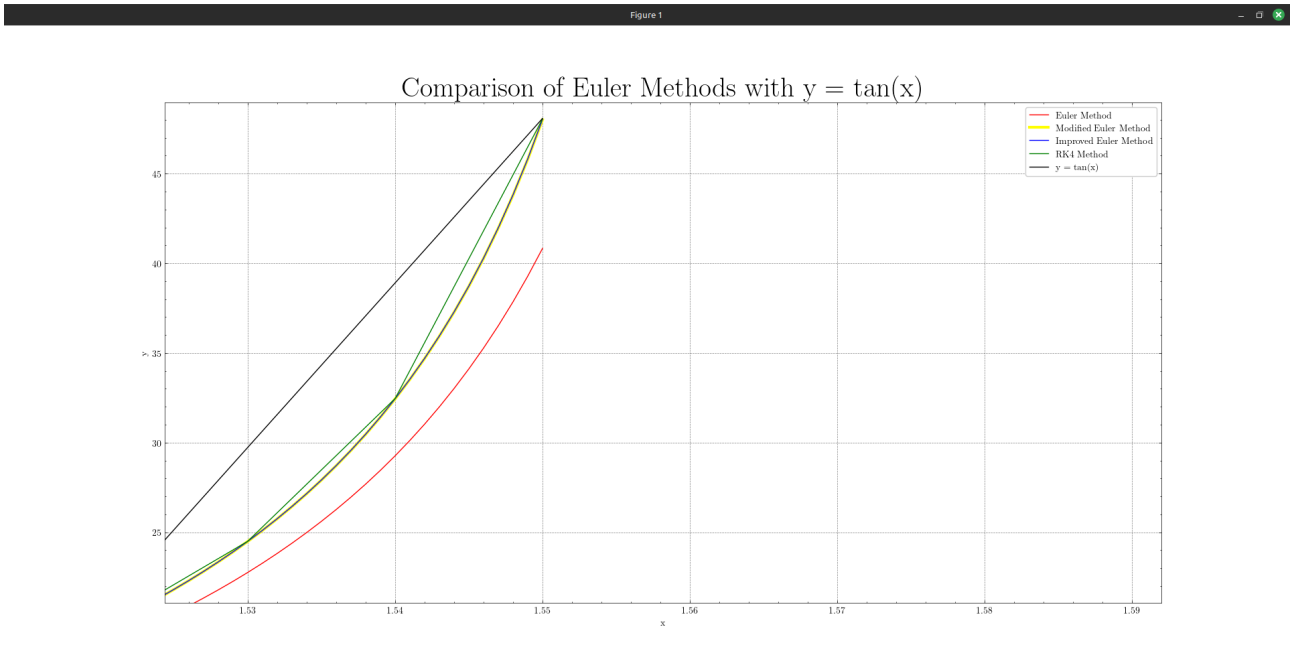
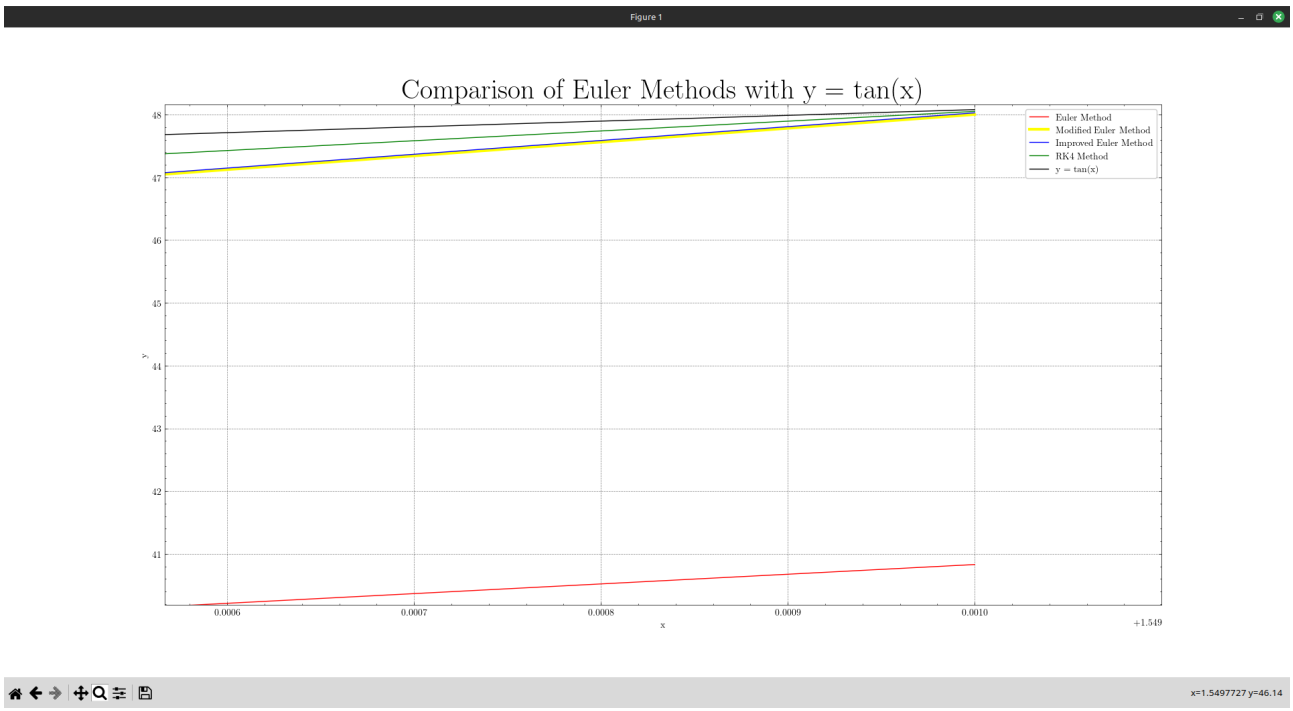
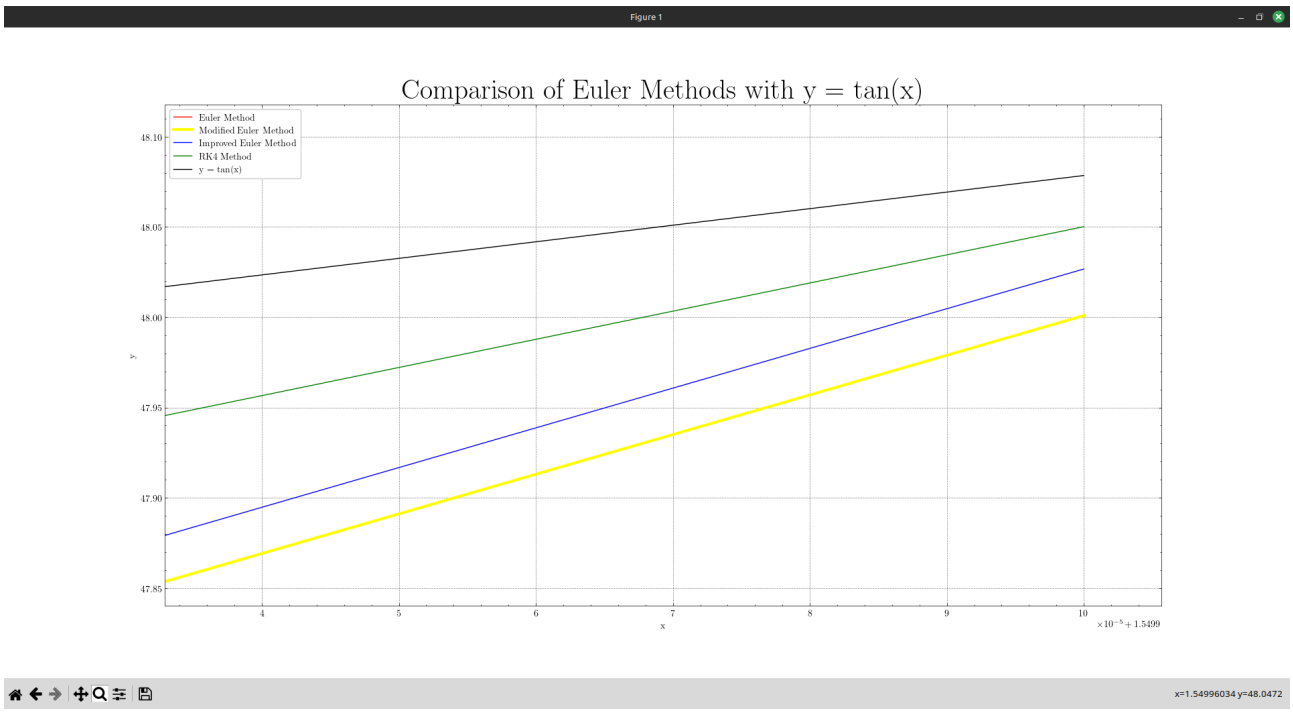
q1),2),3)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
 Enter the step size
0.001
   40.830360212786985
 The value of the difference y_A-y_E at x=1.550 is   7.2476389022032492
   48.000945386010059
 The value the difference y_A - y_ME at x=1.550 is   7.7053728980175151E-002
   48.026717794003119
 The value the difference y_A - y_IE at x=1.550 is   5.1281320987115464E-002
```







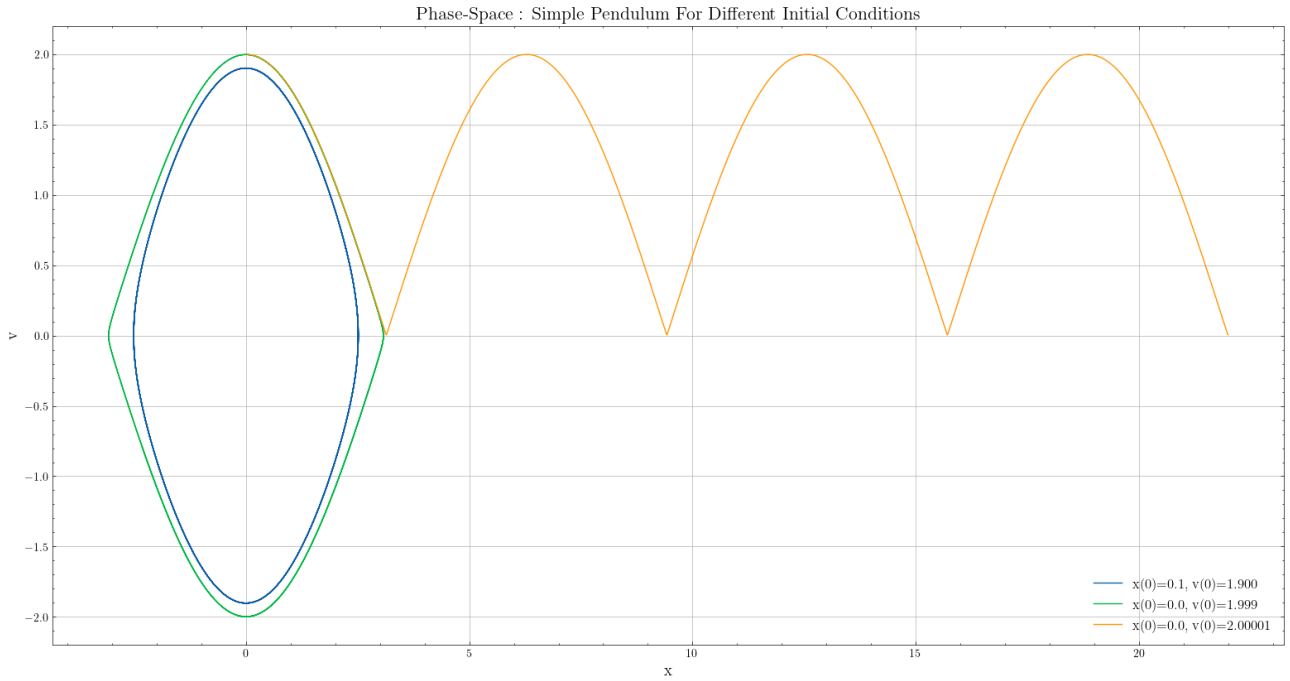


q4)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
 Step Size =    1.0000000000000000E-002
   48.050145886427714
 The value of the difference y_A-y_rk4 at x=1.550 is    2.8336592791355031E-002
```

q5)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
  -2.4031203376272949
```

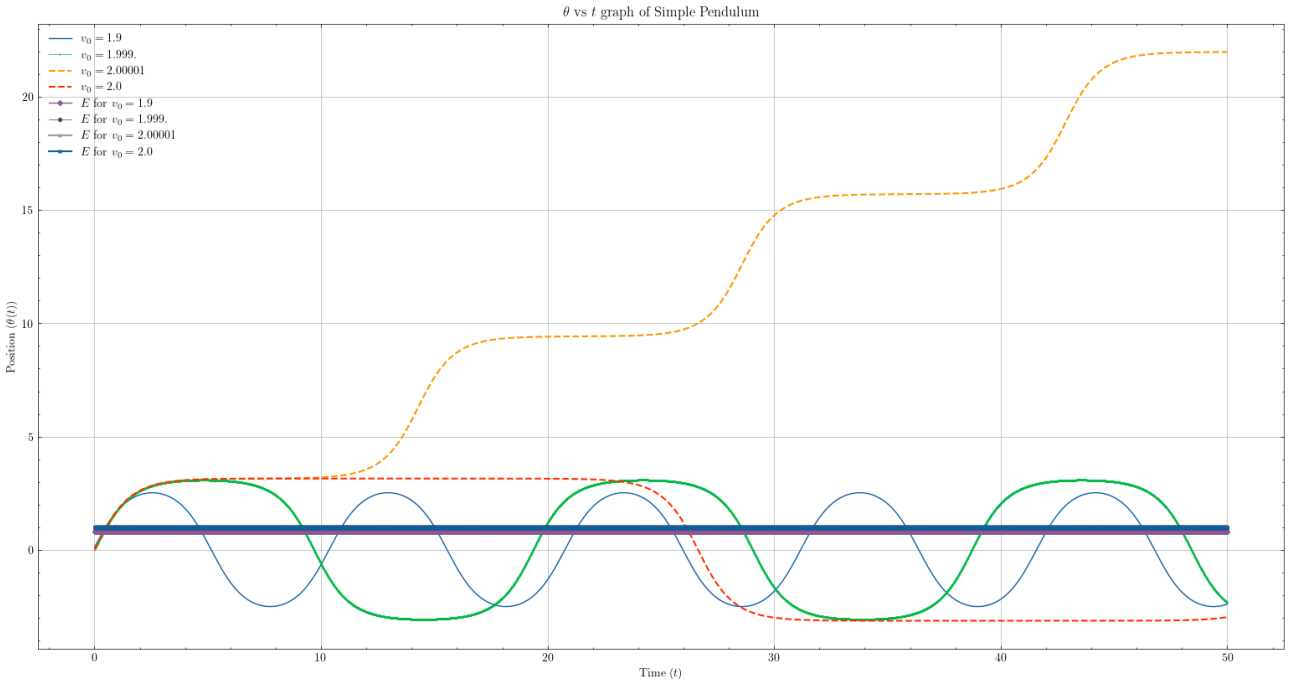


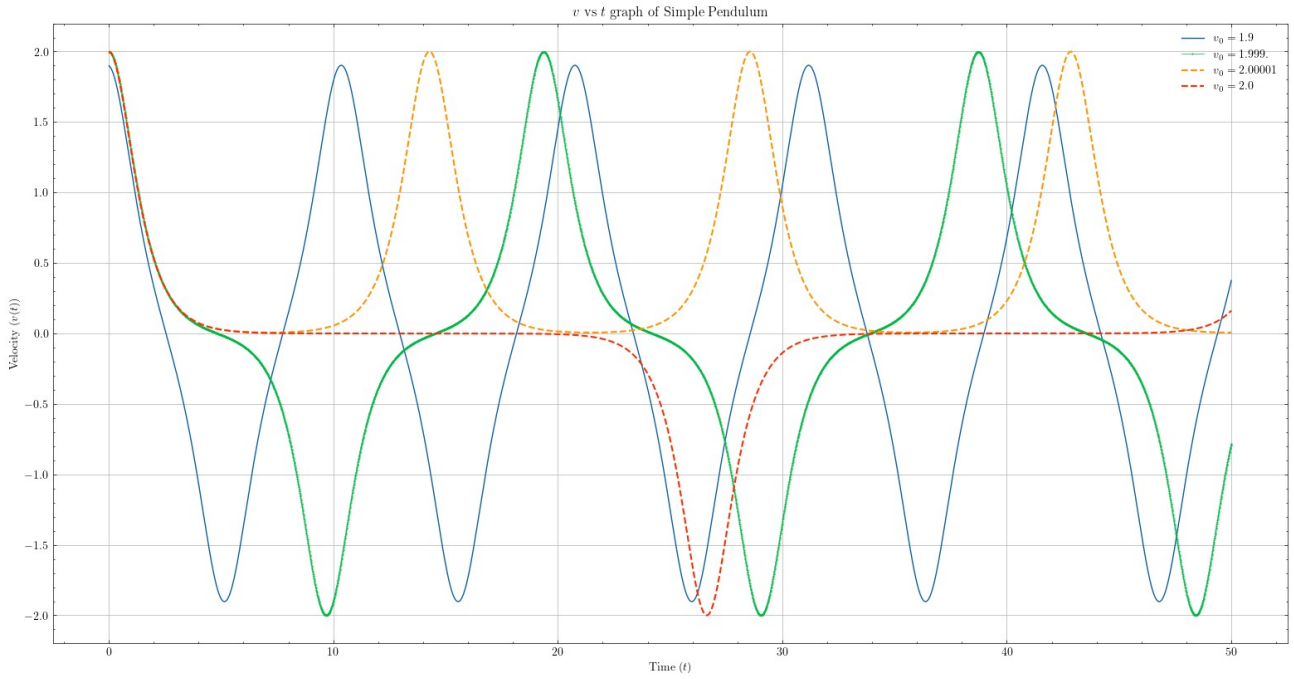
q6)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
  -2.3336044615014728
```

q7)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
   21.991183693997371
```



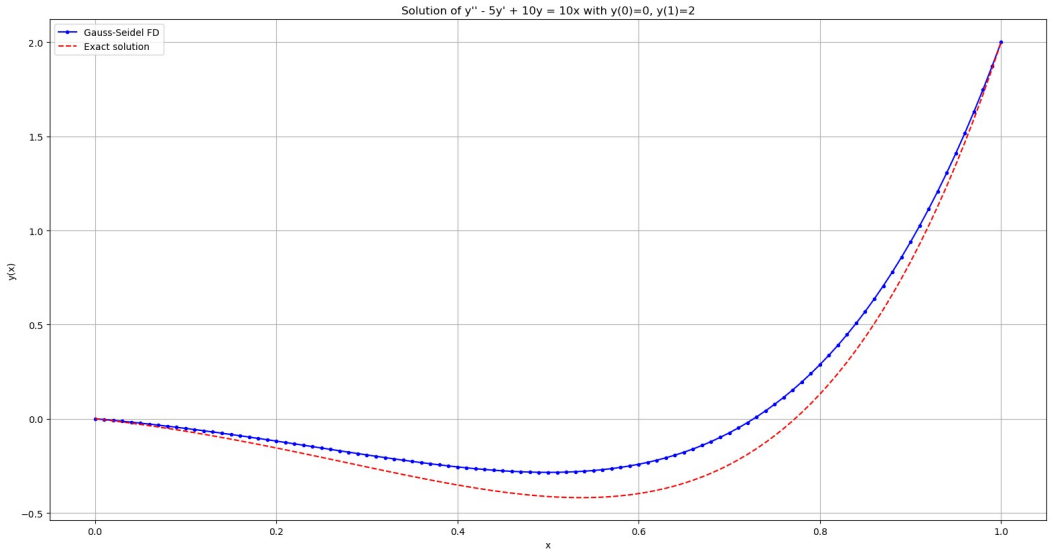


q8)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
 Position of particle 1 after 2000 iterations: -0.11891893262315607
```

q9)

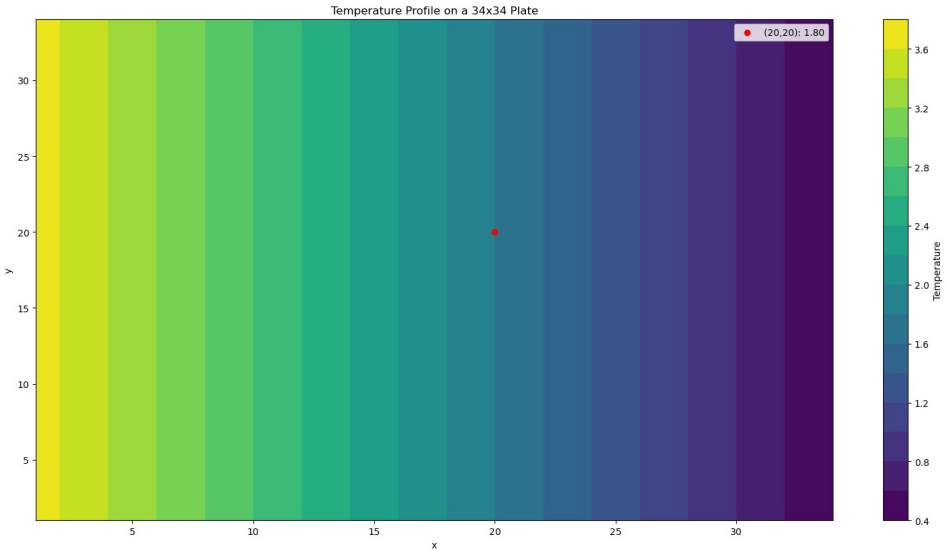
```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
Number of Gauss-Seidel iterations used =  1544
y at x=0.80 is approximately =     0.287167
```



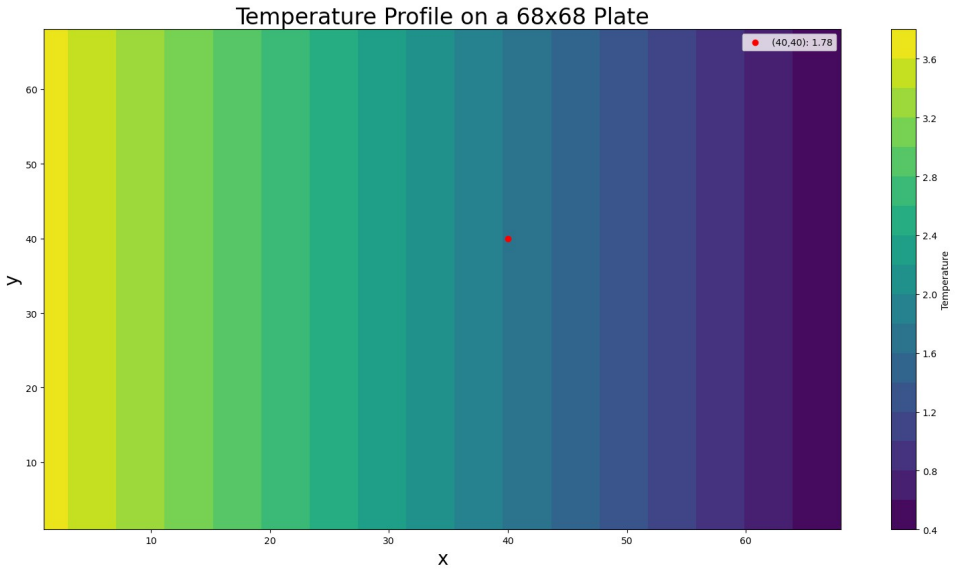
Partial differential Equations

q3)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
 Starting Gauss-Seidel iteration on a          34 x          34  grid...
 Converged after         627  iterations, final diff =    9.9421948267508498E-005
 The temperature at (20,20) is    1.7899564014569984
```

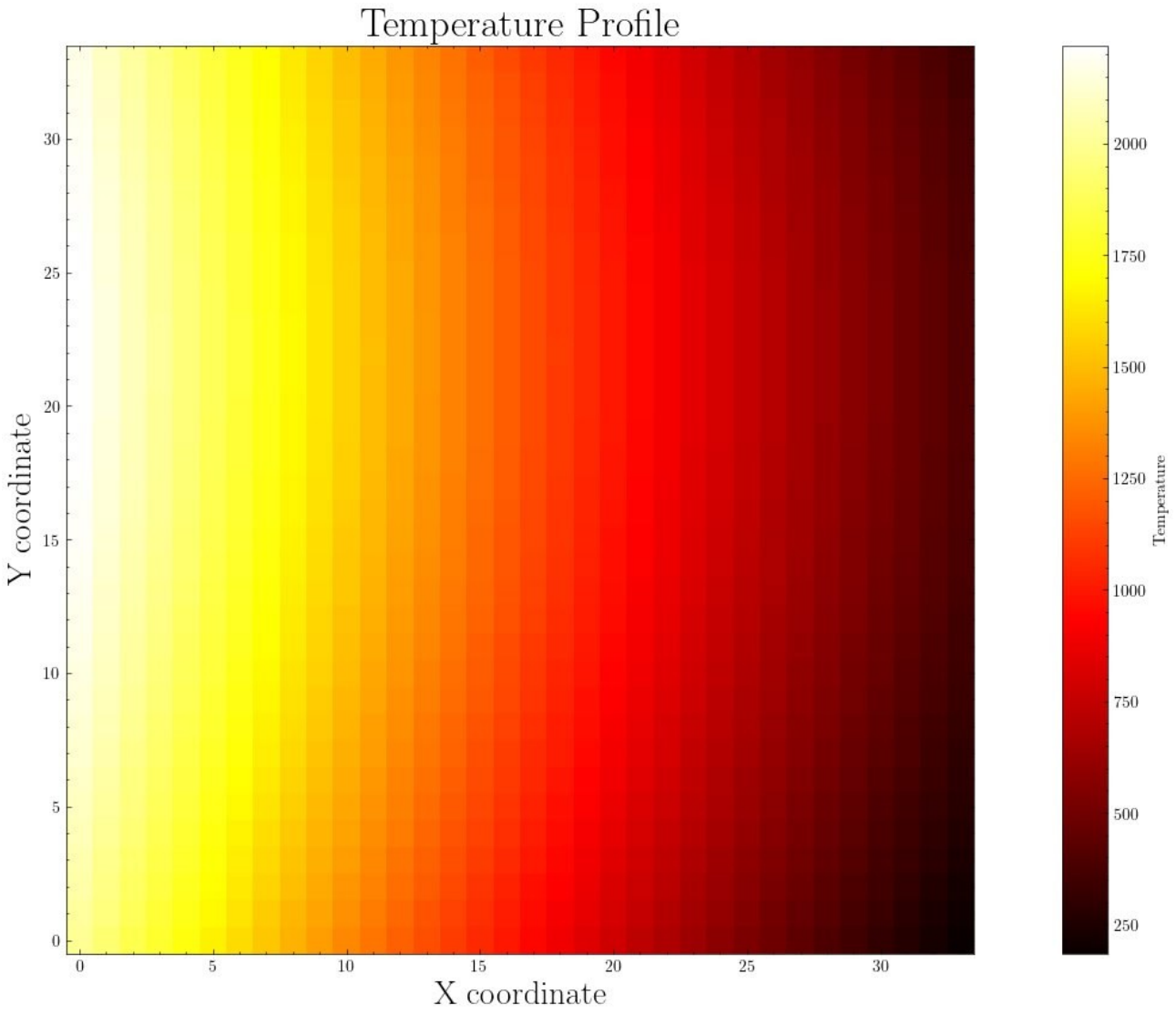



```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
 Starting Gauss-Seidel iteration on a          68 x          68  grid...
 Converged after        1945  iterations, final diff =    9.9919564798600646E-005
 The temperature at (40,40) is    1.7372231235916362
```



q4)

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
 Converged in         1066  iterations
Temperature at (10,10):    1.5500E+03
```


Temperature Profile
Y coordinate
X coordinate
Temperature
0
5
10
15
20
25
30
250
500
750
1000
1250
1500
1750
2000

```
kaustav@kaustav-HP-Laptop-15-fc0xxx:~/Desktop/fortran/Assignment 4$ ./a.out
 Converged in         4190  iterations
Temperature at (20,20):   1.0500E+03
```