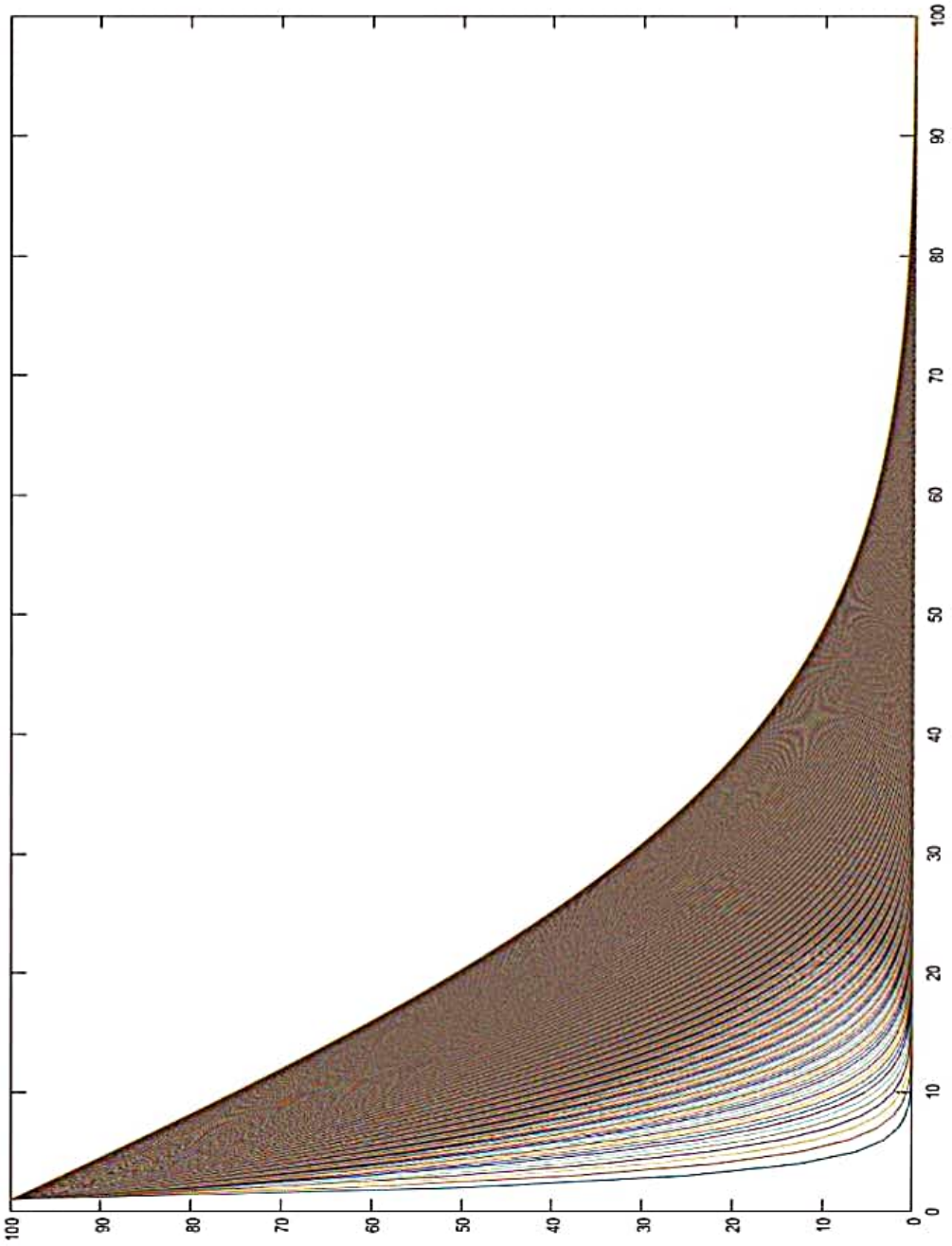
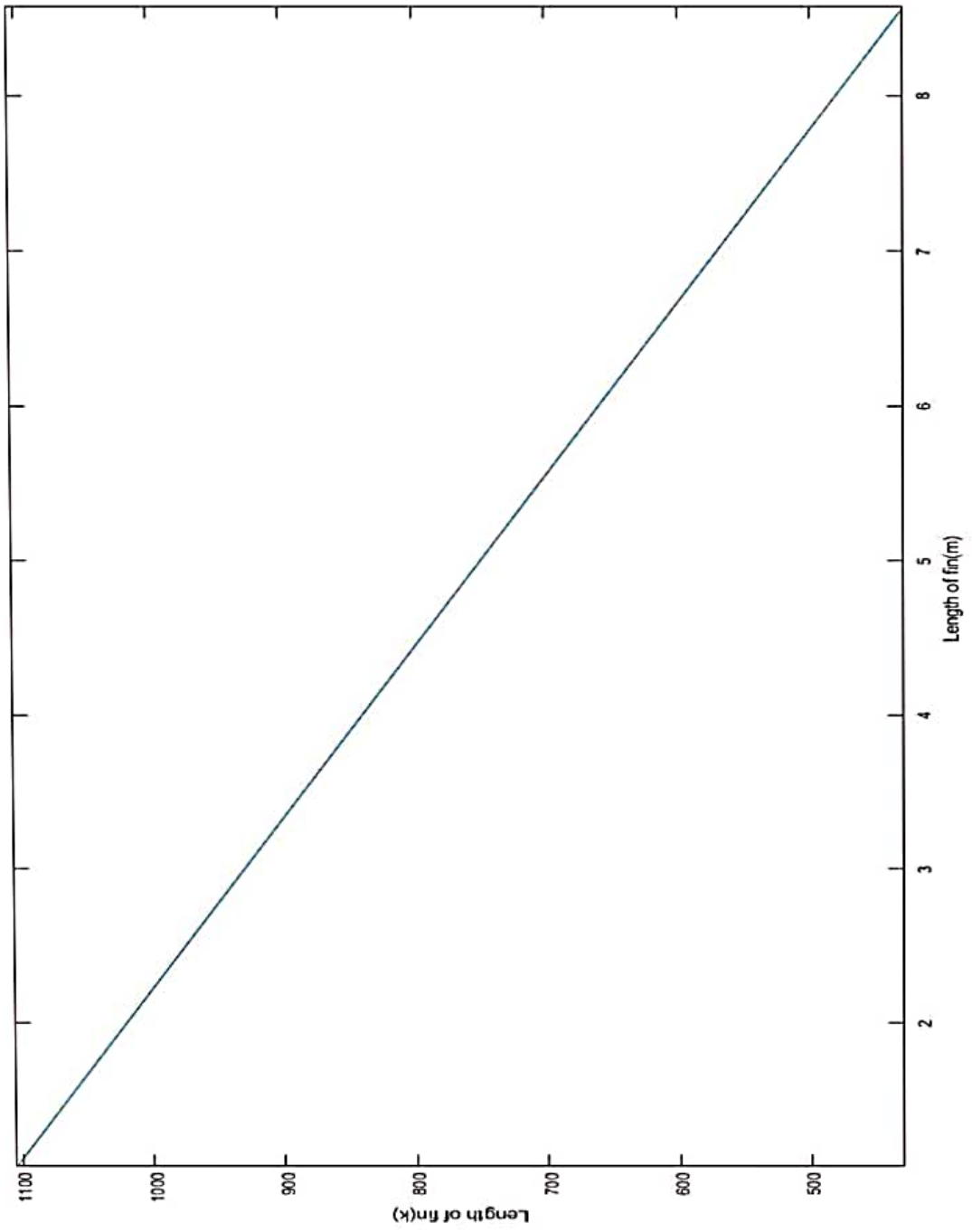
**SOLUTION:**

| | | |
|---|---|---|
| 0.1050 | 39.2683 | 4.9312 |
| 0.0990 | 37.2759 | 4.5393 |
| 0.0945 | 35.3500 | 4.1745 |
| 0.0915 | 33.4906 | 3.8351 |
| 0.0901 | 31.6978 | 3.5199 |
| 0.0901 | 29.9715 | 3.2275 |
| T = | 28.3111 | 2.9564 |
| 100.0000 | 26.7163 | 2.7055 |
| 96.9897 | 25.1864 | 2.4734 |
| 93.9879 | 23.7206 | 2.2591 |
| 90.9988 | 22.3179 | 2.0613 |
| 88.0267 | 20.9773 | 1.8790 |
| 85.0754 | 19.6976 | 1.7112 |
| 82.1491 | 18.4777 | 1.5568 |
| 79.2514 | 17.3160 | 1.4151 |
| 76.3861 | 16.2112 | 1.2850 |
| 73.5568 | 15.1618 | 1.1658 |
| 70.7667 | 14.1662 | 1.0566 |
| 68.0191 | 13.2229 | 0.9568 |
| 65.3171 | 12.3300 | 0.8656 |
| 62.6634 | 11.4860 | 0.7825 |
| 60.0608 | 10.6892 | 0.7066 |
| 57.5117 | 9.9377 | 0.6376 |
| 55.0183 | 9.2298 | 0.5749 |
| 52.5826 | 8.5639 | 0.5180 |
| 50.2065 | 7.9381 | 0.4663 |
| 47.8916 | 7.3508 | 0.4196 |
| 45.6392 | 6.8001 | 0.3773 |
| 43.4506 | 6.2845 | 0.3392 |
| 41.3267 | 5.8022 | 0.3049 |

**GRAPH :**



## GRAPH:


Length of fin(x)
1100
1000
900
800
700
600
500
Length of fin(m)
2
3
4
5
6
7
8

**SOLUTION :**

Dy(x) =

diff(Theta(x), x)

cond =

[Theta(0) == 70, subs(diff(Theta(x), x), x, 1/4) == 0]

p = 0.0628

A = 3.1416e-04

m = 2.0597

eqn(x) =

diff(Theta(x), x, x) - (140*Theta(x))/33

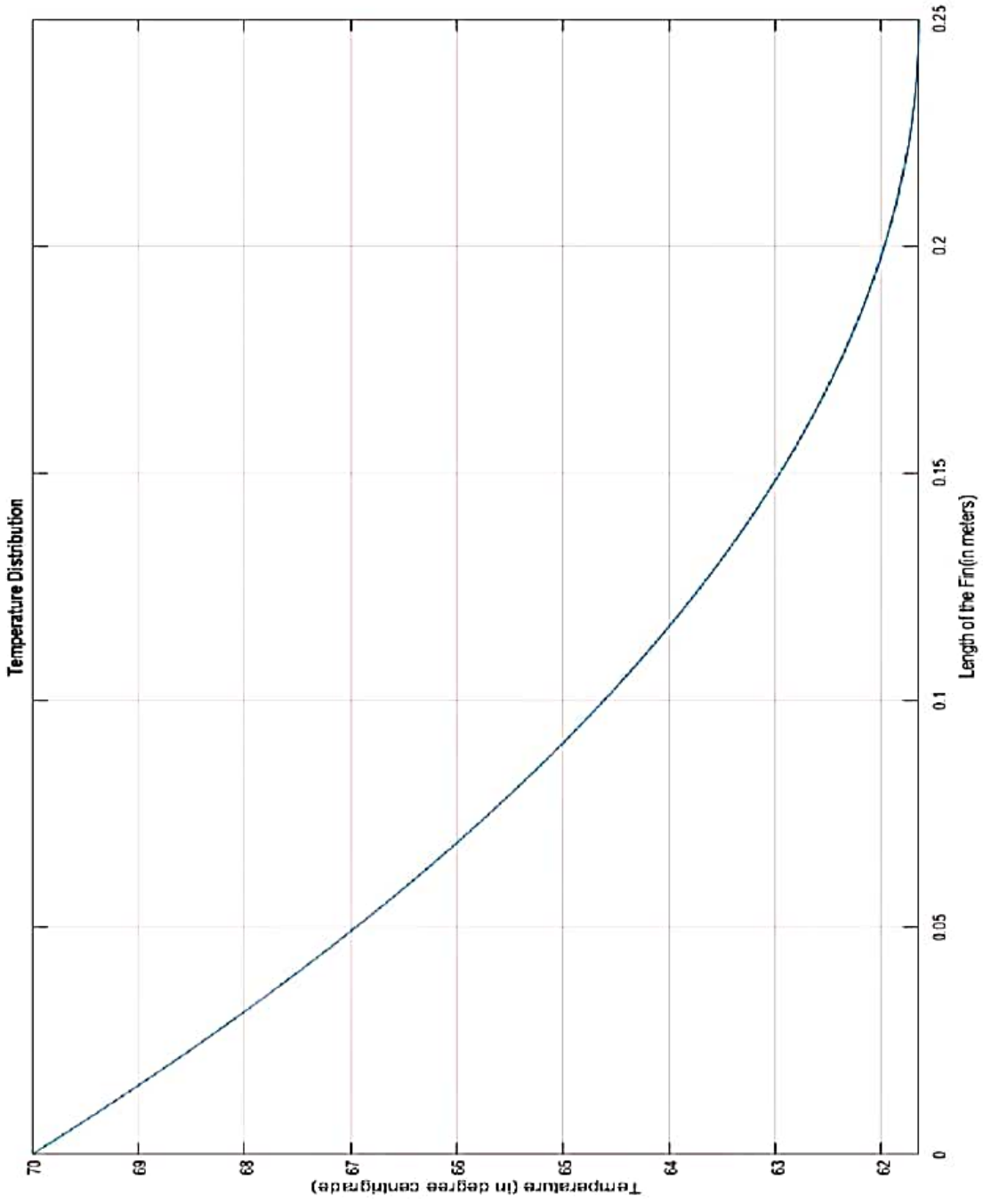
Theta =

(70*exp(-(2*1155^(1/2)*x)/33)*(exp(1155^(1/2)/33) + exp((4*1155^(1/2)*x)/33)))/(exp(1155^(1/2)/33) + 1)

TL = 91.6452

$$\frac{\exp\left(-\frac{2\sqrt{1155}\,x}{33}\right)\left(\exp\left(\frac{\sqrt{1155}}{33}\right)+\exp\left(\frac{4\sqrt{1155}\,x}{33}\right)\right)70}{\exp\left(\frac{\sqrt{1155}}{33}\right)+1}$$

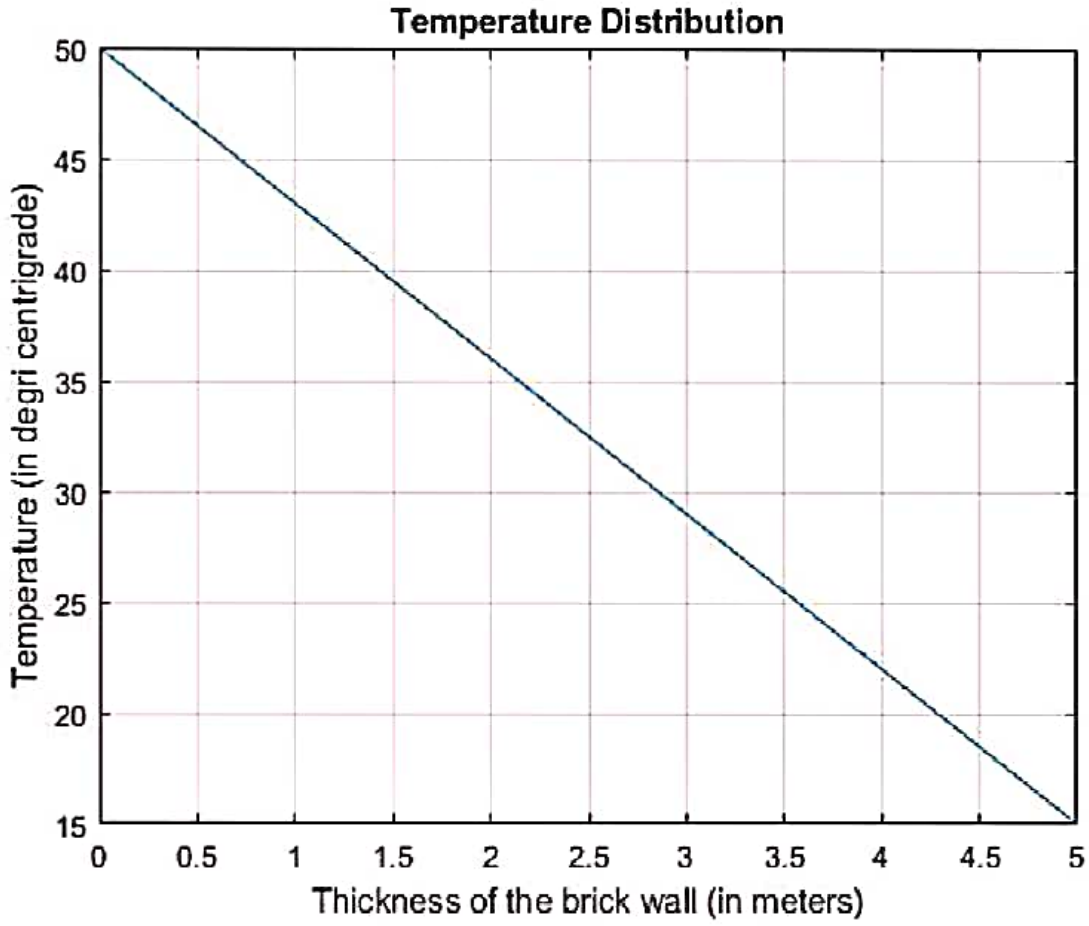
**GRAPH :**


Temperature Distribution
Temperature (in degree centigrade)
Length of the Fin(in meters)
70
69
68
67
66
65
64
63
62
0
0.05
0.1
0.15
0.2
0.25

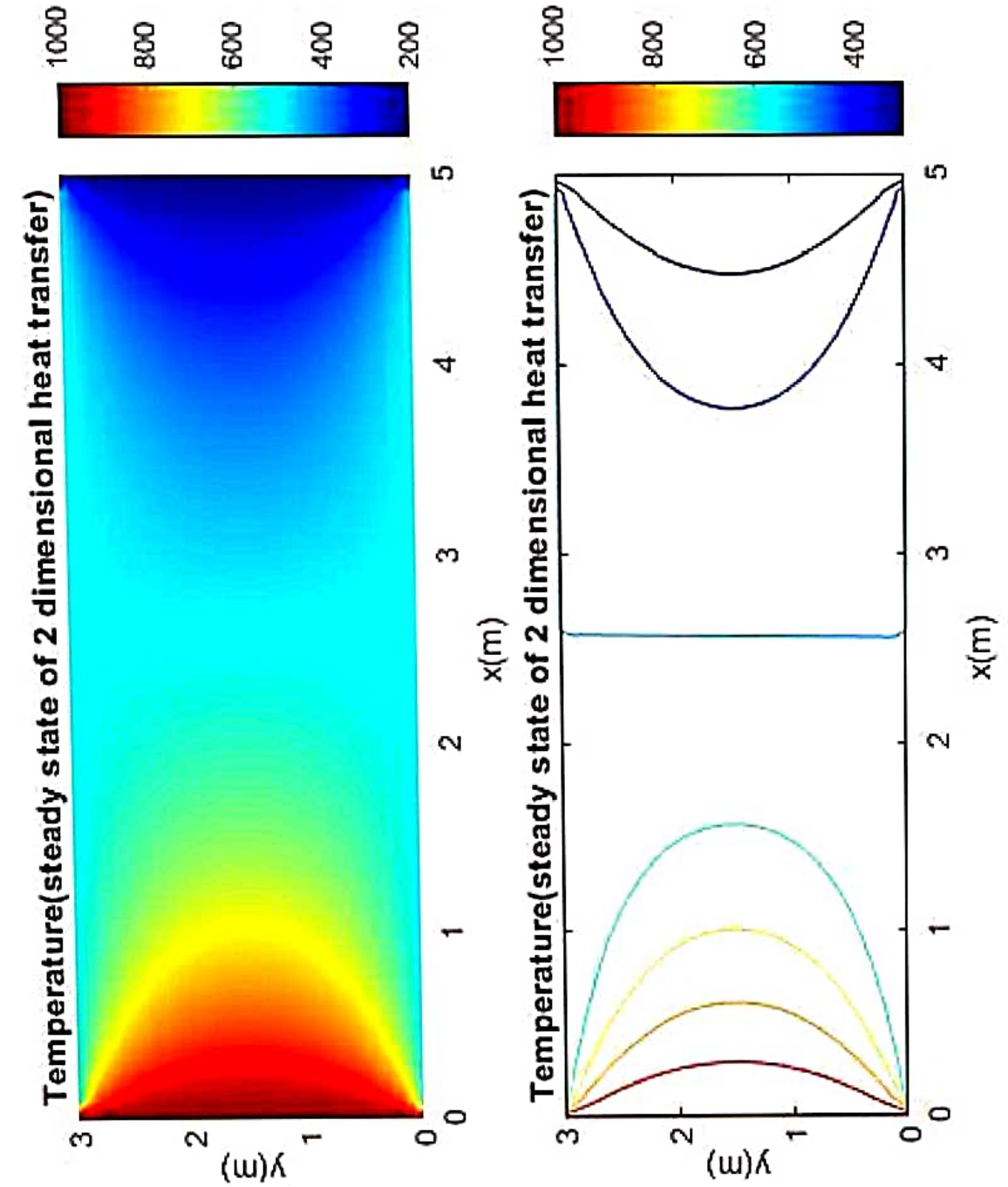
**SOLUTION:**

```
T(0) == 50

ans  =

T(5) == 15

eqn(x) =

diff(T(x), x) + 7

T = 50 - 7*x

Tx =

   48.2500

50 - 7 x
```

**GRAPH:**



**GRAPH:**


Temperature(steady state of 2 dimensional heat transfer)
y(m)
x(m)
1000
800
600
400
200
Temperature(steady state of 2 dimensional heat transfer)
y(m)
x(m)
1000
800
600
400