18/ENG 02/065
Emmanuel Obo
Computer ENG

i) initial reading = 10°C
actual temperature = 25°C

$$\frac{dT}{dt} = -k(T - T_n)$$

k = probability Constant
T = temp of the body

$$\frac{dT}{dt} = 0 \quad kT = kT_n$$

$$\frac{dT}{dt} = k\,10^\circ C = k(25)$$

$$\frac{dT}{dt} = k(25-10)$$

$$\frac{dT}{dt} = 15k$$

$$dT = 15k\,dt$$

$$\int \frac{dT}{k} = \int 15\,dt$$

$$\frac{1}{k}\int dT = \int 15\,dt$$

$$\frac{1}{k}T = 15t$$

after 5, $T = 20^\circ C$

$$\frac{1}{k}(20) = 15 \times 5$$

$$\frac{20}{k} = 75$$

$$75k = 20$$

$$k = \frac{20}{75}$$

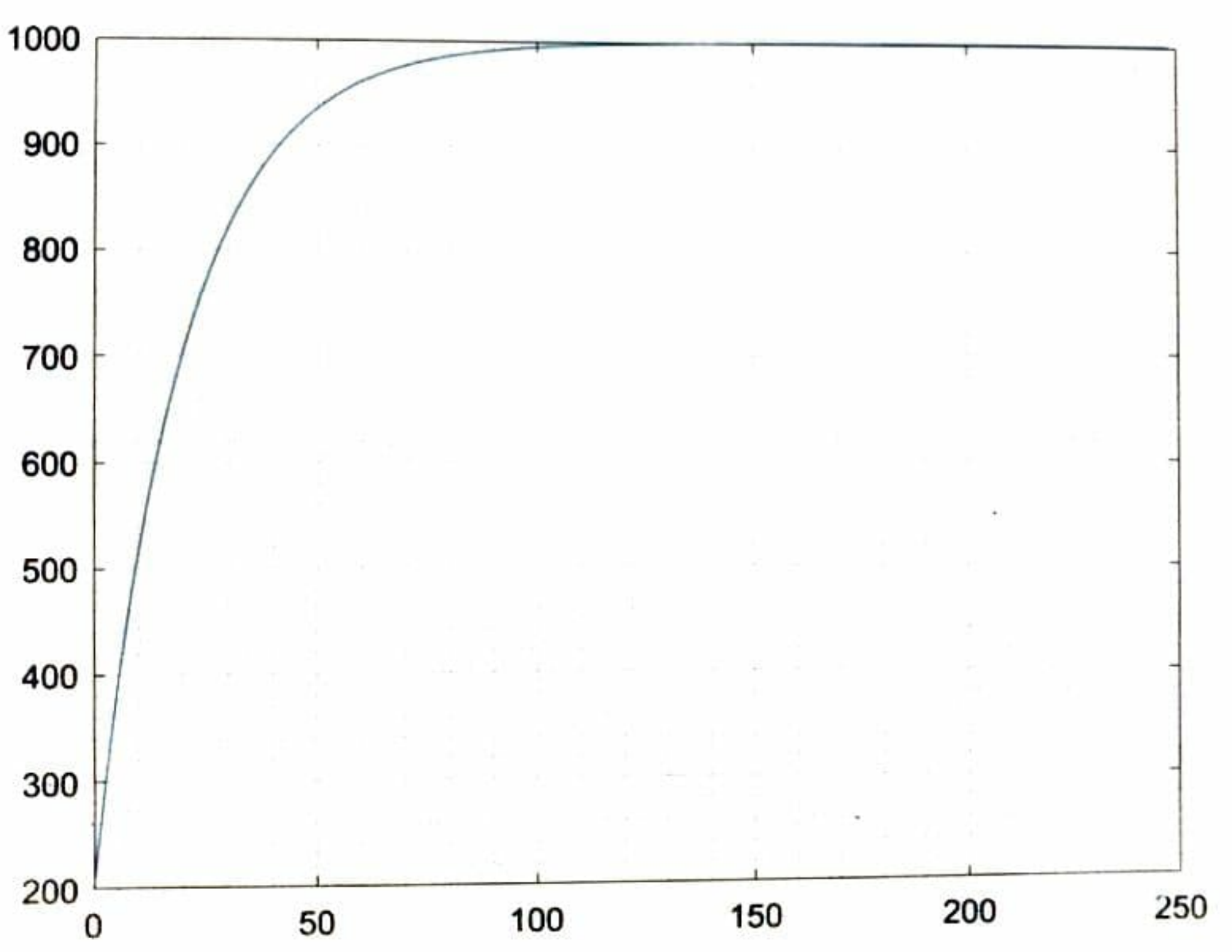
$$\frac{75}{20}T = 15t$$

The time required for the reading to practically reach System Temp, take $T = 24.9$

$$\frac{75 \times 24.9}{20} = 15t$$

$$t = \frac{75 \cdot 24.9}{20 \times 15}$$

$$t = 6.22 \text{ mins}$$


1000
900
800
700
600
500
400
300
200
0
50
100
150
200
250

BREAKPOINTS RUN

ATLAB

Editor - C:\Users\yimat\Documents\MATLAB\yimaquiz2.m

yimaquiz2.m

```
commandwindow
clear
clc
close all
format short g
mdata=xlsread('onlinequizdata','fluiddata')
x=mdata(1:2:250,1)
y=mdata(1:2:250,2)
plot(x,y)
grid on
grid minor
```

ommand Window

```
    86
    88
    90
    92
    94
    96
    98
   100
   102
```

script Ln 11 Col 11