

MEZE HANNAH CHIBUEZE

18/ENG05/031

MECHATRONICS ENGINEERING

① Initial temp = 10°C at 0°C
 $5_{\text{min}} = 20^{\circ}\text{C}$
actual temperature = 25°C
 $x_{\text{min}} = 24.9^{\circ}\text{C}$
at $5_{\text{min}} = 20.25 = 22.5^{\circ}\text{C}$

$$y = y_0 e^{kt}$$
$$22.5 = 10 e^{k \cdot 5}$$
$$2 \cdot 25 = e^{5k}$$
$$\ln 2.25 = k$$
$$\frac{1}{5}$$
$$k = 0.162$$
$$24.9 = 10 e^{0.162t}$$
$$2.49 = e^{0.162t}$$
$$\ln 2.49 = 0.162t$$
$$\frac{\ln 2.49}{0.162} = t$$
$$t = 5.63_{\text{min}}$$

$\therefore 5.63_{\text{min}} \approx 24.9^{\circ}\text{C}$

```
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
```

I

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

Ln 11 Col 11