

ONOFIOLK ABASIFREKES

18/ENG031 060

CIVIL ENGINEERING

$$T_{\text{initial}} = 10^{\circ}\text{C} \quad T = 20^{\circ}\text{C} \text{ at } 6 \text{ mins.}$$

$$T_{\text{actual}} = 25^{\circ}\text{C}$$

$$dT/dt \propto (T - T_a)$$

$\therefore T_a = \text{Actual temp.}$

$$dT/dt = L(T - 25) \quad \frac{dT}{T - 25} = k dt$$

$$\ln(T - 25) = kt + C, \quad T - 25 = e^{kt+C}$$

$$T = T_0 e^{kt}, \quad T = T_0 e^{kt} + 25$$

At  $t = 0$

$$10 = T_0 + 25$$

$$10 - 25 = T_0$$

$$T_0 = -15$$

$$\text{ANS: } T = -15e^{-0.219t} + 25$$

$$T_0 = -15e^{kt} + 25$$

$$20 = -15e^{kt} + 25 \quad \therefore -15e^{kt} = -5$$

$$\frac{-5}{-15} = \frac{-15e^{kt}}{-15}$$

$$0.33 = e^{kt} e^{k6}$$

$$\therefore -1.09 = k5$$

$$k = -0.219 //$$

```
ATLAB
Editor - C:\Users\yimat\Documents\MATLAB\yimaquiz2.m
yimaquiz2.m x +
- commandwindow
- clear
- clc
- close all
- format short g
- mdata=xlswread('onlinequizdata','fluiddata')
- x=mdata(1:2:250,1)
- y=mdata(1:2:250,2)
- plot(x,y)
- grid on
- grid minor|

Command Window
0e
88
90
92
94
96
98
100
102
script |Ln 11, Col 11
```

