

Lawal Testim
18/ENGG06/038
Mechanical Engineering

$$y = y_0 e^{kt}$$

$$\frac{y}{y_0} = e^{kt}$$

$$\therefore \frac{y}{y_0} = e^{kt} = 3 \quad \text{at } t=9$$

$$\frac{y}{y_0} = e^{kt} = 9 \quad \text{at } t=18$$

$$\therefore y_0 = 50 \dots (i)$$

$$y_0 = 150 \dots (ii)$$

$$\therefore y = 50e^{kt} \dots (iii)$$

$$y = 150e^{kt} \dots (iv)$$

$$\therefore 3 = e^{kt}$$

$$\ln 3 = \ln e^{kt}$$

$$\ln 3 = kt$$

$$k = \frac{\ln 3}{9}$$

$$k = 0.122$$

$$9 = e^{kt}$$

$$\ln 9 = \ln e^{kt}$$

$$\ln 9 = k(18)$$

$$k = \frac{\ln 9}{18}$$

$$k = 0.122$$

$$\therefore y = 50e^{0.122t} \dots (v)$$

$$y = 150e^{0.122t} \dots (vi)$$

$t = 0, 1, \dots, 15$

$$A(t) = 50 \exp(0.122 t)$$

$$B(t) = 150 \exp(0.122 t)$$

A(t) =

| |
|---------|
| 50 |
| 56.488 |
| 63.817 |
| 72.098 |
| 81.453 |
| 92.022 |
| 103.962 |
| 117.451 |
| 132.691 |
| 149.908 |
| 169.359 |
| 191.334 |
| 216.161 |
| 244.209 |
| 275.896 |
| 311.694 |

B(t) =

| |
|---------|
| 150 |
| 169.463 |
| 191.452 |
| 216.293 |
| 244.358 |
| 276.065 |
| 311.885 |
| 352.354 |
| 398.073 |
| 449.725 |
| 508.078 |
| 574.003 |
| 648.483 |
| 732.626 |
| 827.687 |
| 935.083 |

