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Chemical Engineering

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

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

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

$$\therefore y_0 = 50 \text{ --- (i)}$$

$$y_0 = 150 \text{ --- (ii)}$$

$$y = 50 e^{kt} \text{ --- (iii)}$$

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

Therefore, $3 = e^{kt}$

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

$$\therefore \ln 3 = kt$$

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

$$\therefore k = 0.122$$

And, at $t = 18$,

$$9 = e^{kt}$$

$$\ln 9 = \ln e^{k(18)}$$

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

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

$$\therefore k = 0.122$$

$$\therefore y = 50 e^{0.122t}$$

and

$$y = 150 e^{0.122t}$$



Normal

Arial

10

B *I* U

$$Y_1(t) := 50e^{0.122t}$$

$$Y_2(t) := 150e^{0.122t}$$

