

Assignment 4

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Engineering Mathematics II (EN6272)

18/EN601/021
Chemical Engineering
Solution

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

$$y = 3y_0$$

$$\frac{y}{y_0} = 3$$

y_0

$$A \quad y = e^{kt} = 3 \text{ at } t = 9$$

y_0

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

y_0

$$A \quad y_0 = 50 \dots$$

$$B \quad y_0 = 150 \dots$$

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

$$y = 150 e^{kt} \dots$$

Since, $3 = e^{kt}$

$$\therefore \ln 3 = kt$$

$$\ln 3 = 9k$$

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

9

$$k = 0.122$$

Since, $9 = e^{kt}$

$$\ln 9 = 18k$$

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

18

$$k = 0.122$$

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

$$y = 150 e^{0.122t} \dots B$$

$$r = 0.1 \text{ h}^{-1}$$

A(0) = 50 exp(0.122 t)

A(0) =	50
	56.488
	61.817
	72.098
	81.451
	92.022
	103.962
	117.451
	132.691
	149.908
	169.359
	191.334
	216.161
	244.209
	275.896
	311.694

B(0) = 150 exp(0.122 t)

B(0) =	150
	169.461
	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

