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Mechatronics Engineering

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

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

$$A \times \frac{y}{y_0} = e^{kt} \quad e^{kt} = 3 \quad (at \ t=9)$$

$$B \times \frac{y}{y_0} = e^{kt} = 9 \quad (at \ t=9)$$

$$Ay_0 = 50 \quad \text{--- (1)}$$

$$By_0 = 150 \quad \text{--- (2)}$$

$$y = 50e^{kt}$$

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

$$3 = e^{kt}$$

$$\ln 3 = kt$$

$$\ln 3 = 9k$$

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

$$k = 0.122$$

$$9 = e^{kt}$$

$$\ln 9 = 18k$$

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

$$k = 0.122$$

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

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

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

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

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

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

