Mathcad Professional - [Untitled:1]

File Edit View Insert Format Math Symbolics Window Help

$t := 0..15$

$A(t) := 50 \cdot e^{(0.122 \cdot t)}$

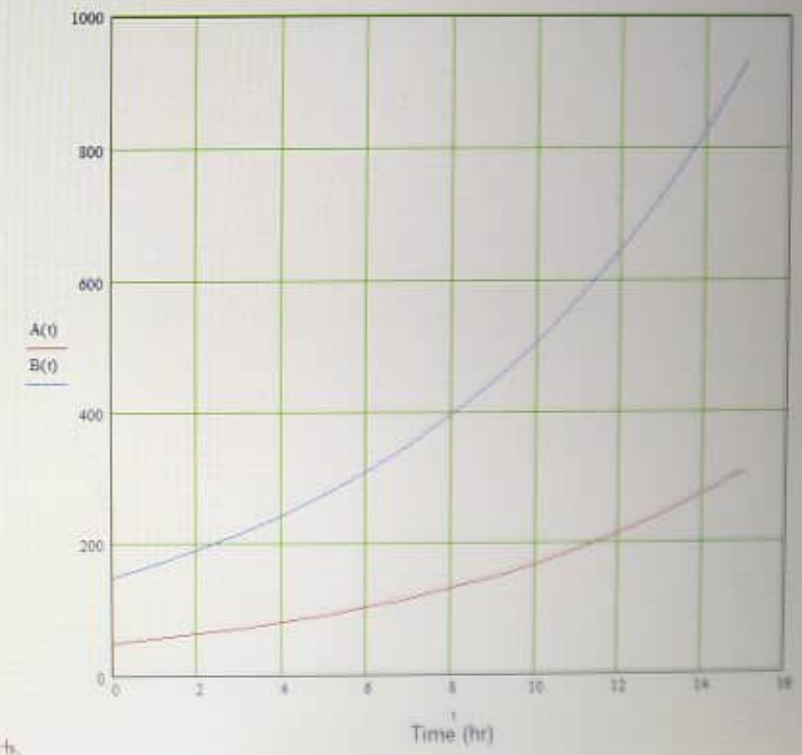
$B(t) := 150 \cdot e^{(0.122 \cdot t)}$

$A(t) =$

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



Press F1 for help

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Mechatronics
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Assignment IV

Let y be the population

$$\frac{dy}{dt} \propto y(t)$$

$$\frac{dy}{dt} = ky$$

$$\frac{dy}{y} = k\,dt$$

$$\int \frac{dy}{y} = \int k\,dt$$

$$\ln y = kt + C$$

$$y = e^{kt+C}$$

$$y = e^{C} \times e^{kt}$$

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

$$k = 0.122\ldots$$

For Case A $y_0 = 50$

Hence

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

For Case B $y_0 = 150$

Hence:

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