

Solutions

Each answer shows the steps, then the **result**.

2.1

- $y = 30e^{0.2t}$

2.2

- $80e^{-0.5} = 80(0.6065) \approx 48.5$

2.3

- $200 = 100e^{2k}; e^{2k} = 2; k = \frac{1}{2} \ln 2 \approx 0.347$

3.1 B

- $\frac{dy}{dt} = ky$ gives $y = y_0e^{kt}$

3.2

(a)

- $30 = 40e^{5k}; e^{5k} = 0.75; k = \frac{1}{5} \ln 0.75 \approx -0.0575$

(b)

- $A = 40e^{-0.0575(12)} = 40e^{-0.690} \approx 20.0$ mg

3.3

(a)

- $8000 = 1000e^{6k} \Rightarrow e^{6k} = 8 \Rightarrow k = \frac{1}{6} \ln 8 \approx 0.347$

(b)

- $16000 = 1000e^{kt} \Rightarrow e^{kt} = 16 \Rightarrow t = \frac{\ln 16}{0.347} \approx 8$ h