

Solutions

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

2.1

- $x - 1 = e^2 \Rightarrow x = 1 + e^2 = 8.39$

2.2

- $\ln \frac{a^2}{b}$

3.1 A

- $e^{-x} = 0.4 \Rightarrow -x = \ln 0.4 \Rightarrow x = -\ln 0.4 = \ln 2.5$

3.2

- let $u = e^x$: $u^2 - 7u + 10 = 0 \Rightarrow (u - 2)(u - 5) = 0$; $e^x = 2$ or 5 ; $x = \ln 2$ or $\ln 5$

3.3

(a)

- $\frac{1}{2}P_0 = P_0e^{-5k} \Rightarrow e^{-5k} = 0.5 \Rightarrow -5k = \ln 0.5$; $k = 0.139$

(b)

- $0.1 = e^{-kt} \Rightarrow t = \frac{\ln 0.1}{-0.139} = 16.6$ years