

$$\textcircled{6} \quad P_0 = 100 \rightarrow t = 0 \quad t = 24 \rightarrow m = ?$$

$$-\frac{dm}{dt} = km$$

$$-dm = km dt$$

$$\frac{dm}{m} = k dt$$

$$-\int \frac{dm}{m} = \int k dt$$

$$-\ln(m) = kt + c$$

$$\ln(m) = -kt + c$$

$$e^{\ln(m)} = e^{-kt+c}$$

$$m = e^{-kt} \cdot e^c$$

$$m = C e^{-kt}$$

$$100 = C e^{-kt}$$

$$100 = C$$

$$m = 100 e^{-kt}$$

$$P_6 = 100 * (0.03)^6$$

$$P_6 = 3$$

$$P_6 = 100 - 3 \rightarrow 97$$

$$P_6 > 97$$

0.1218368299

$$97 = 100 e^{-kt}$$

$$\frac{97}{100} = e^{-kt}$$

$$\ln\left(\frac{97}{100}\right) = -kt$$

$$\ln\left(\frac{97}{100}\right) = -6k$$

$$\ln\left(\frac{97}{100}\right) = k$$

$$-\left(\frac{\ln\left(\frac{97}{100}\right)}{6}\right)t$$

$$m = 100 e$$

$$t = 24 + \left[ \frac{\ln(97) - \ln(100)}{6} \right] 24$$

$$m = 100 e$$

-0.1218368299

$$m = 100 e$$

$$m = 88.5292$$

La cantidad que queda después de 24 horas  
es 88.5292 miligramos.

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$$\frac{50}{2} = 100 e^{\left(\frac{\ln 97 - \ln 100}{6}\right)t}$$
$$\frac{1}{2} = e^{\left(\frac{\ln 97 - \ln 100}{6}\right)t}$$
$$\ln\left(\frac{1}{2}\right) = \left[\frac{\ln(97) - \ln(100)}{6}\right]t + \ln e^t$$
$$\frac{6 \ln\left(\frac{1}{2}\right)}{\ln(97) - \ln(100)} = t$$
$$136.5394 = t$$

La vida media de la sustancia radioactiva  
es de 136.5394 horas

24

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I

$$t = 3 \text{ ft}$$

$$I_{(3)} = I_0 e^{-3K}$$

$$I_0 e^{-3K} = I_{(3)}$$

$$\frac{dI}{dt} = -K I$$

$$\frac{dI}{I} = -K dt$$

$$\int \frac{dI}{I} = -K \int dt$$

$$-Kt + C$$

$$\ln I = -Kt + C$$

$$e^{\ln I} = e^{-Kt + C}$$

~~$$(I) = e^{-Kt} \cdot e^C$$~~

$$I = e^{-Kt} \cdot C$$

$$I = e^{-K(0)} \cdot C$$

$$I_0 = C$$

t = espesor, en pies

$$I_0 e^{-3K} = I_{(0.25)}$$

$$I_0 e^{-3K} = I_{(0.25)}$$

$$\ln 0.25 = -3K$$

$$\frac{\ln 0.25}{-3} = K$$

$$0.4624 = K$$

$$I_{(15)} = I_0 e^{-0.4624(15)}$$

$$I_{(15)} = I_0 e^{-6.9315}$$

$$I_{(15)} = I_0 e^x$$

$$I_{(15)} = I_0 [0.0009765]$$

La intensidad del rayo a 15 pies  
abajo la superficie,  
~~el resultado~~ seria el resultado  
de multiplicar  
0.0009765 por la  
intensidad  
iniciale ( $I_{(0)}$ )

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$$\frac{ds}{dt} = rs$$

a)

$$\$5000 = S(0)$$

$$t=5 \rightarrow S(5) = ?$$

$$r = \frac{5.3}{4 \cdot 1} = \frac{5.75}{100} = 0.0575$$

$$\frac{ds}{s} = rt dt \rightarrow \int \frac{ds}{s} = r \int dt$$

$$\ln(s) = rt + C \rightarrow e^{\ln(s)} = e^{rt+C}$$

$$s = e^{rt} \cdot e^C \rightarrow s = C e^{rt}$$

$$5000 = C e^{0.0575 \cdot 0}$$

$$5000 = C$$

$$s = 5000 e^{0.0575 t}$$

$$s = 5000 e^{0.0575(5)} = 6665.45$$

La cantidad reunida después de 5 años es igual a  $\$6665.45$

R

b)

$$(2)(\cancel{5000}) = 5000 e^{0.0575t}$$

$$a = e^{0.0575t} \rightarrow \ln(2) = 0.0575t \ln e^1$$

$$\frac{\ln(2)}{0.0575} = t \rightarrow t = 12.05$$

El capital inicial se habrá duplicado después de 12.05 años

(c)  $S = 5000 \left(1 + \frac{1}{4}(0.0575)\right)^{20}$

$$S = 6651.82$$

$$\Delta S = 6665.45 - 6651.82$$

$$\Delta S = 13.63$$

El resultado cuando se reune trimestralmente varia en \$13.63, que cuando se reune anualmente.

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