MMM Exponential Growth HW Answers

(1) a $\frac{dV}{dT} = kV \qquad V = V_0 e^{kT}$

(b) $V(T) = 4700e^{-0.0375T}$

(c)

(d) $4,572.05

(e) $T = 36.406$

(f) $15,026.80

(2) (a) $\frac{dC}{dT} = kC$

(b) $P(T) = 100e^{-0.000121T}$

(c) 61.743%

(d) Piece of wood is ≈6024 years old.

(3) $\frac{dP}{dh} = kP$

(a) $P(h) = 101.3e^{-0.000151h}$

(b) 39,782

(c) 4,675m

(4) (a) $\frac{dC}{dT} = kC$

(b) $C(T) = .00372e^{-0.062T}$

(c) a couple of ways to do this

$C(20) =$ _ or $.015 = C(T)$

no, safe.

(5)

(5) (a) $\frac{dC}{dT} = -0.2C \quad C(T) = C_0 e^{-0.2T}$

(b) 23.026 yrs.

(c) 18.421 yrs

(d) 64.472 yrs.

(6) $\frac{dB}{dT} = .05B \quad B = \text{balance}$

$B = a_0 e^{.05T}$

(b) 46.052 yrs.

(c) 21.972 yrs.

(d) 138.155 yrs

(7) 612.259 kg.