

Exponentials Story Problems

$$A(t) = A_0 (b)^{\frac{t}{h}}$$

← time
 ← how often the rate applied
 ← rate such as half-life, doubling
 ← initial amount
 ← Amount after 't'

5. $56 = 1792 \left(\frac{1}{2}\right)^{\frac{t}{30}}$

~~1792~~ ~~1792~~

$$\frac{1}{32} = \left(\frac{1}{2}\right)^{\frac{t}{30}}$$

$$\frac{1}{2^5} = \frac{1}{2}^{t/30}$$

~~$$2^{-5} = 2^{-t/30}$$~~

$$\frac{-5}{1} = \frac{-t}{30}$$

$$-t = -150$$

$t = 150 \text{ hours}$

$$6. \quad \frac{6075}{25} = \frac{25(3)}{25} \left(\frac{3}{4} \right)^{t/4}$$

$$243 = 3^{t/4}$$

$$\frac{3^5}{3} = \frac{3^{t/4}}{3}$$

$$5 = \frac{t}{4}$$

$$20 = t$$

20 Years

$$7. // \quad A(t) = 14000(2)^{t/4}$$

$$\frac{224000}{14000} = \frac{14000(2)^{t/4}}{14000}$$

$$16 = 2^{t/4}$$

$$\frac{2^4}{2} = \frac{2^{t/4}}{2}$$

$$4 = \frac{t}{4}$$

$$16 = t$$

16 days

$$\begin{aligned} 1. \quad A(t) &= A_0 \left(\frac{1}{2} \right)^{\frac{t}{1200}} \\ &= 150 \left(\frac{1}{2} \right)^{\frac{4800}{1200}} \\ &= 150 \left(\frac{1}{2} \right)^4 \end{aligned}$$

$$2. \quad 18 \text{ yrs} = 9.375 \text{ grams}$$

$$3. \quad 16 \text{ yrs}$$

$$4. \quad \$6062.87$$

$$5 \text{ a) } 6480$$

$$\text{b) } 2528 \text{ grams}$$

$$6 \text{ a) } 500$$

$$\text{b) } 800 \text{ yrs}$$

c)