

24

doubling
time.

$$y = 1(1.12)^t$$

$$2 = (1.12)^t$$

$$\ln 2 = \ln(1.12)^t$$

$$\ln 2 = t \ln(1.12)$$

$$\frac{\ln 2}{\ln 1.12}$$

$$= t$$

26

3.40670/day. ^{not} continuing

$$A(t) = A_0 (0.96504)^t$$

$$\frac{1}{2} A_0 = A_0 (0.96504)^t$$

$$\frac{1}{2} = 0.96504^t$$

$$\ln \frac{1}{2} = t \ln(0.96504)$$

$$\frac{\ln(1/2)}{\ln(0.96504)} = t$$

7 35

$$\lambda = 2 \text{ hrs.}$$

continuous
growth
decay.

$$A(t) = A_0 b^t$$

$$A(t) = A_0 e^{kt}$$

$$\frac{1}{2} A_0 = A_0 e^{2k}$$

$$\frac{1}{2} = e^{2k}$$

$$\ln\left(\frac{1}{2}\right) = \ln(e^{2k})$$

$$\ln\left(\frac{1}{2}\right) = 2k \ln(e)$$

$$-0.347 \approx \frac{1}{2} \ln\left(\frac{1}{2}\right) = k$$

34

$$P(t) = 5.2 (1.031)^t$$

$$P(t) = 5.2 e^{kt}$$

$$e^k = 1.031$$

$$\ln(e^k) = \ln(1.031)$$

$$k = \ln(1.031)$$