

Hw 6.5 #9

$$Y(t) = Y(0)e^{rt}$$

$$P = P_0 e^{rt}$$

$$B = B_0 e^{rt}$$

$$Y(t) = 100 e^{\ln 2 / 30 \cdot t}$$

$$\frac{1}{2} = 2^{-1}$$

$$= 100 e^{\ln 2 / 30 \cdot t}$$

$$= 100 e^{-\ln 2 / 30 \cdot t}$$

$$= 100 (2)^{-t/30}$$

$$Y(30) = 100 e^{30k}$$

$$\frac{50}{100} = \frac{100 e^{30k}}{100}$$

$$\frac{1}{2} = e^{30k}$$

$$\ln \frac{1}{2} = 30k$$

Part C

$$\frac{\ln \frac{1}{2}}{30} = k \quad | = 100 (2)^{-t/30}$$

$$\frac{1}{100} = 2^{-t/30}$$

$$\log_2 \frac{1}{100} = -t/30$$

$$-30 \log_2 \frac{1}{100} = t$$

$$199.32 \text{ yrs.} = t$$