

Phoebe Small

$$1. \quad \frac{6850}{4320} = \frac{4320 e^{r \cdot 10}}{4320}$$

$$1.586 = e^{10r}$$

$$\ln(1.586) = 10r$$

$$\frac{0.461}{10} = \frac{10r}{10}$$

$$0.0461 = r$$

$$\frac{17500}{4320} = \frac{4320 e^{0.0461 \cdot t}}{4320}$$

$$4.051 = e^{0.0461 t}$$

$$\ln(4.051) = 0.0461 t$$

$$\frac{1.399}{0.0461} = \frac{0.0461 t}{0.0461}$$

$$30.35 \text{ sec} = t$$

$$2. \quad \frac{25000}{4320} = \frac{4320 e^{0.0461 t}}{4320}$$

$$5.787 = e^{0.0461 t}$$

$$\ln(5.787) = 0.0461 t$$

$$\frac{1.756}{0.0461} = \frac{0.0461 t}{0.0461}$$

$$38.1 \text{ sec} = t$$

Solving with logs practice (2.5)

$$1. \quad \frac{5600}{3500} = \frac{3500 \left(1 + \frac{0.065}{4}\right)^{4t}}{3500}$$

$$1.6 = \left(1 + \frac{0.065}{4}\right)^{4t}$$

$$1.6 = 1.01625^{4t}$$

$$\frac{\log 1.01625 \cdot 1.6}{4} = \frac{4t}{4}$$

$$t = 7.29 \text{ years}$$

2.

$$0.5 = e^{14r}$$

$$\frac{\ln(0.5)}{14} = \frac{14r}{14}$$

$$-0.0495 = r$$

$$\frac{11}{160} = \frac{160e^{-0.0495t}}{160}$$

$$0.0688 = e^{-0.0495t}$$

$$\frac{\ln(0.0688)}{-0.0495} = \frac{-0.0495t}{-0.0495}$$

$$\boxed{54.07 \text{ years} = t}$$

3.

$$\frac{15500}{8500} = \frac{8500 \left(1 + \frac{0.06}{2}\right)^{2t}}{8500}$$

$$1.824 = 1.03^{2t}$$

$$\log_{1.03} 1.824 = 2t$$

$$20.32 = 2t$$

$$\boxed{10.16 \text{ years} = t}$$

4.

$$0.5 = e^{7r}$$

$$\frac{\ln(0.5)}{7} = \frac{7r}{7}$$

$$-0.099 = r$$

$$\frac{21}{500} = \frac{500e^{-0.099t}}{500}$$

$$0.042 = e^{-0.099t}$$

$$\frac{\ln(0.042)}{-0.099} = \frac{-0.099t}{-0.099}$$

$$\boxed{32.01 \text{ minutes} = t}$$

$$5. \left(\frac{30300000 \text{ km}^2}{1} \right) \left(\frac{1000 \text{ m}}{\text{km}} \right)^2 = 30300000000000 \text{ m}^2$$

$$\frac{10}{30300\dots} = \frac{303000000000000}{30300\dots} \left(\frac{1}{2} \right)^x$$

$$3.3 \times 10^{-13} = \left(\frac{1}{2} \right)^x$$

$$\log_{\left(\frac{1}{2}\right)} 3.3 \times 10^{-13} = x$$

$$x = 41.46$$

42 fences

$$6. 0.45 = e^{5r}$$

$$\frac{\ln(0.45)}{5} = \frac{5r}{5}$$

$$-0.16 = r$$

$$0.2 = e^{-0.16x}$$

$$\frac{\ln(0.2)}{-0.16} = \frac{-0.16x}{-0.16}$$

$$x = 10 \frac{7}{7} \text{ layers}$$

$$7. \left(\frac{1000 \text{ acres}}{1} \right) \left(\frac{4000 \text{ plants}}{\text{acre}} \right) = 4000000 \text{ plants}$$

$$4000000 = 1.9^{\frac{1}{2}t}$$

$$\log_9 4000000 = \frac{1}{2}t$$

$$\cdot 2 \quad \quad \cdot 2$$

$$t \approx 14 \text{ years}$$