

$$1. a) A = 10000 \left(1 + \frac{.08}{4}\right)^{(4)(5)} = \boxed{\$14859.47} \quad b) A = 10000 e^{(.08)(5)} = \boxed{\$14918.25}$$

Quarterly:

$$c) 20000 = 10000 \left(1 + \frac{.08}{4}\right)^{4t}$$

$$2 = 1.02^{4t}$$

$$t = \frac{\ln 2}{4 \ln 1.02} = \boxed{8.751 \text{ yrs}}$$

$$20000 = 10000 e^{.08t}$$

$$2 = e^{.08t}$$

$$t = \frac{\ln 2}{.08} = \boxed{8.664 \text{ yrs}}$$

$$2. 906 = 643 e^{r(16)} \quad \rightarrow \quad \boxed{A = 643 e^{-.021431t}}$$

$$r = .021431$$

$$b) 2000 = 643 e^{.021431t}$$

$$\boxed{t = 52.950 \text{ yrs}}$$

$$3. r = \frac{\ln 1/2}{28} = -.024755$$

$$a) A = P e^{-.024755t}$$

$$b) 10 = 60 e^{-.024755t}$$

$$\boxed{t = 72.379 \text{ yrs}}$$

$$4. r = \frac{\ln 1/2}{140}$$

$$a) A = 300 e^{\left(\frac{1}{140} \ln 1/2\right)t}$$

$$b) A = 300 e^{\left(\frac{1}{140} \ln 1/2\right)(365)} = \boxed{49.237 \text{ mg}}$$

$$c. 200 = 300 e^{\left(\frac{1}{140} \ln 1/2\right)t}$$

$$\boxed{t = 81.895 \text{ days}}$$

$$5. r = \frac{\ln 1/2}{153}$$

$$.30P = P e^{\left(\frac{1}{153} \ln 1/2\right)t}$$

$$.3 = e^{-.00453t}$$

$$\boxed{t = 265.756 \text{ days}}$$

$$6. a) t=0 \Rightarrow f(0) = \frac{0.8}{1+e^0} = \frac{.8}{2} = \boxed{.4}$$

$$b) t=10 \quad f(10) = \frac{0.8}{1+e^{-.2(10)}} = \boxed{.705}$$

$$c) \boxed{.8}$$