

$$1. a) n=1$$

$$A = P \cdot (1 + APR)^y$$

$$= \$100 (1 + 0.036)^3$$

$$= \boxed{\$111.19}$$

$$b) n=12$$

$$A = P \cdot \left(1 + \frac{APR}{n}\right)^{ny}$$

$$= \$100 \cdot \left(1 + \frac{0.036}{12}\right)^{12 \cdot 3}$$

$$= \boxed{\$111.38}$$

$$c) A = P \cdot e^{APR \cdot y}$$

$$= \$100 \cdot e^{0.036 \cdot 3}$$

$$= \boxed{\$111.40}$$

d) Relative change after ONE YEAR, so same as above, but $y=1$.

$$A = \$100(1 + 0.036)$$

$$= \$103.6$$

$$\frac{\text{new-old}}{\text{old}} = \frac{0.036}{1}$$

$$= \boxed{3.6\%}$$

$$A = \$100 \cdot \left(1 + \frac{0.036}{12}\right)^{12}$$

$$= \cancel{\$100} \$103.6600$$

$$\frac{\$103.6600 - \$100}{\$100} = \boxed{3.66\%}$$

$$A = \$100 \cdot e^{0.036}$$

$$= \$103.6656$$

$$\frac{\$103.6656 - \$100}{\$100} = \boxed{3.6656\%}$$

2. a) APY = rel. change after 1 year. Say $P = \$100$.

DAILY: $A = \$100 \cdot \left(1 + \frac{0.0351}{365}\right)^{365}$

$$= \$103.5722$$

$$\frac{\$103.5722 - \$100}{\$100} = \boxed{3.5722\%}$$

QUARTERLY: $A = \$100 \cdot \left(1 + \frac{0.0355}{4}\right)^4$

$$= \$103.5975$$

$$\frac{\$103.5975 - \$100}{\$100} = \boxed{3.5975\%}$$

So **QUARTERLY** is better.

$$b) A = P \cdot \left(1 + \frac{APR}{n}\right)^{n \cdot y}$$

$$\$100,000 = P \cdot \left(1 + \frac{0.0355}{4}\right)^{4 \cdot 18}$$

$$\frac{\$100,000}{\left[\left(1 + \frac{0.0355}{4}\right)^{4 \cdot 18}\right]} = P$$

$$P = 100000 \div \left(\left(1 + 0.0355 \div 4\right)^{1(4 \times 18)}\right) = \$52930.9949$$

So really $\boxed{\$52931.00}$

3. a) $A = PMT \times \frac{\left[\left(1 + \frac{APR}{n}\right)^{ny} - 1\right]}{\left(\frac{APR}{n}\right)}$ So really $\boxed{\$52931.00}$

$$= \$200 \times \frac{\left[\left(1 + \frac{0.04}{12}\right)^{12 \cdot 10} - 1\right]}{\left(\frac{0.04}{12}\right)}$$

$$= \boxed{\$29,449.96}$$

b) $\$100,000 = PMT \times \frac{\left[\left(1 + \frac{0.04}{12}\right)^{12 \cdot 18} - 1\right]}{\left(\frac{0.04}{12}\right)}$

$$\frac{\$100,000}{\left[\frac{\left[\left(1 + \frac{0.04}{12}\right)^{12 \cdot 18} - 1\right]}{\left(\frac{0.04}{12}\right)}\right]} = PMT$$

$$PMT = 100000 \div \left(\left[\frac{\left[\left(1 + 0.04 \div 12\right)^{12 \cdot 18} - 1\right]}{\left(0.04 \div 12\right)}\right]\right)$$

$$= \boxed{\$316.87}$$

HOMEWORK 5