Name:

Quiz #4

Instructions: do all of the following problems on **both sides** of this paper. Show all of your work.

1. Norman secures a savings account for his newborn child that compounds monthly at an APR of 5.8%.

(a) Norman wants to make monthly deposits into the account for 30 years. If he wants his child to have \$800,000 in 30 years, how much must he deposit each month?

$$800,000 = \text{PMT}\left(\frac{12}{.058}\right)\left[\left(1+\frac{.058}{12}\right)^{(12)(30)} - 1\right]$$
$$800,000 = \text{PMT}(966.933722)$$
$$827.36 = \text{PMT}$$

(b) What percentage of the \$800,000 in the account will have been earned in interest?

$$\text{total paid} = (827.36)(12)(30) = 297,849.60$$

$$\text{interest} = 800,000 - 297,849.60 = 502,150.40$$
$$\frac{502,150.40}{800,000} = .6277$$

So 62.77% of the \$800,000 came from interest.

2. Melinda is taking out a loan to buy a car. Her bank offers her a loan of \$18,170 that compounds monthly at an APR of 8.75%.

(a) Compute her monthly payment for a 4-year loan and a 5-year loan.

4-year:

$$\text{PMT} = \frac{18,170\left(\frac{.0875}{12}\right)}{1-\left(1+\frac{.0875}{12}\right)^{-(12)(4)}} = 450.01$$

5-year:

$$\text{PMT} = \frac{18,170\left(\frac{.0875}{12}\right)}{1-\left(1+\frac{.0875}{12}\right)^{-(12)(5)}} = 374.98$$

(b) How much money does she save over the life of the loan if she pays it off in 4 years instead of 5 years?

$$\text{4-year total paid} = 450.01(12)(4) = 21,600.48$$

$$\text{5-year total paid} = 374.98(12)(5) = 22,498.80$$

$$\text{amount saved} = 22,498.80 - 21,600.48 = 898.32$$