

NAME:

**Problem 1 (5 points):** *In 1753, upon turning into a vampire, Angel decides to invest the \$2 he has in his pockets in a savings account earning 5% interest compounded annually. How much money does Angel have in his account when he decides to withdraw all his money to start up a private investigation firm 245 years later?*

**Solution:** The balance in Angel's account is:

$$\$2 \cdot (1.05)^{245} = \$310,747.95.$$

**Problem 2 (5 points):** *Realizing that he needs a cool car, and having spent all his savings on office space, Angel decides to take out a \$30,000 loan to purchase a black '67 Plymouth GTX. If the interest on the loan is 12% a year, how much will his monthly payments be if he amortizes the loan over a period of 4 years?*

**Solution:** Angel's monthly payments will be:

$$\$ \frac{30,000 \cdot (.01)}{1 - (1.01)^{-48}} \approx \$790.02.$$

**Problem 3 (5 points):** *After discovering the size of the monthly payments if he amortizes his loan over a period of 4 years, Angel decides to take advantage of his immortality by amortizing the loan over a period of 200 years. What will his monthly payments be in this case?*

**Solution:** In this case, Angel's monthly payments will be:

$$\$ \frac{30,000 \cdot (.01)}{1 - (1.01)^{-2400}} \approx \$300.00.$$