MATH 1030; A GUIDE TO QUIZ V

1) Compute
   a) \( \log_2(64) = \)
   b) \( \log_{10}(10^3) = \)

2) Half life of price of a garage is 15 years. What is the annual depreciation rate? How much is a $30,000 garage worth after a) 30 years, b) 20 years?

3) The doubling time of a city population is 17 years. What is the annual growth rate? How much does it take for the population to a) quadruple, b) triple?

4) You have put a certain amount of money in a CD. Using the rule of 72, determine the approximate time it takes for the value of the CD to double if APR is a) 4%, b) 8%, c) 12%.

   In the following formula \( P_m \) is the principal, after \( m \) months, of a loan or a savings plan, with an initial principal \( P_0 \), an annual percentage rate \( r \), and a monthly payment \( p \). The sign \( \pm \) is – if this a loan, and is + if this is a savings plan (if \( p = 0 \) then the formula reduces to the usual compound interest formula):

   \[
   P_m = (1 + \frac{r}{12})^m \times P_0 \pm \frac{(1 + \frac{r}{12})^m - 1}{\frac{r}{12}} \times p.
   \]

   Use the formula in the following three exercises:

   5) You have taken a loan in the amount $100,000 with APR 6%. You make $600 monthly payments on the loan. How many months will it take to pay off this loan?

   6) Re: loan in exercise 4). What should be your monthly payments if the loan is to be paid off in 30 years?