Problem 1: What are the four parts of a good change answer?

1.

2.

3.

4.

Problem 2: Write down the following interest formulas, and then fill in the blanks for what each of the variables in the formula represent:

Interest compounded \( n \) times per year: Continuously compounded interest:

\[ A = \quad P = \quad r = \quad t = \quad \]

Problem 3: Write down the following formulas for APR and APY:

a. APR (also known as the \( \quad \) rate)

annually:

per compounding period:

b. APY (also known as the \( \quad \) rate):

for \( n \) compoundings per year:

for continuous compounding:
**Problem 4:** The population of New Mexico between 1921 and 2000 is given by the model

\[ P(t) = 7.6(1.026^t) \text{ million persons} \]

where \( t \) is the number of years since 1900.

a. How much did the population change from 1940 through 1955? Round to the nearest hundredth.

b. What was the percentage change from 1940 through 1955? Round the percentage to the nearest tenth.

c. How rapidly was the population changing on average from 1983 through 1985. (In other words, find the average rate of change from 1983 through 1985.) Round to the nearest hundredth.

**Problem 5:** In order to offset college expenses, at the beginning of your freshman year you obtained a nonsubsidized student loan for $15,000. Interest of this loan accrues at a rate of \( .739\% \) each month (hint: think about how to convert this into an appropriate interest rate for the whole year). However, you do not have to make any payments against either the principal or the interest until after you graduate.

a. Write a complete model giving the total amount (in dollars) you will owe after \( t \) years in college. 
   \text{Hint: use the formula for an investment made at \( n \) compoundings per year.}

b. What is the nominal rate? Round the percentage to the nearest thousandth.

c. What is the effective rate? Round the percentage to the nearest thousandth.

**Problem 6:** Suppose you make an investment where the interest is \( 6.3\% \) compounded quarterly. Find the doubling time for this investment. Round the answer to the nearest hundredth. (Note: you are not given the principal/initial amount because the problem does not depend on the amount of money deposited.)