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:

\[ A = \text{_______________________________} \quad P = \text{_______________________________} \]

\[ r = \text{_______________________________} \quad t = \text{_______________________________} \]

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

a. APR (also known as the __________________ rate):

   annually:

   per compounding period:

b. APY (also known as the __________________ rate):

   for $n$ compoundings per year:

   for continuous compounding:
**Problem 4:** Your credit card statement indicates a finance charge of 1.5% per month on the outstanding balance.

   a. What is the nominal rate, assuming that interest is compounded monthly?

   b. What is effective rate of interest?

**Problem 5:** The time it takes an average athlete to swim 100 meters freestyle at age $x$ years can be modeled by the equation

$$T(x) = 0.181x^2 - 8.463x + 147.376 \text{ seconds}$$

   a. Use the numerical method to find the rate of change of the time for a 13-year-old swimmer to swim 100 meters freestyle (hint: find $T'(13)$).

   **Guidelines:** Be sure to check at least 4 values on both sides of 13. Clearly label the columns of your table(s). Below your tables, clearly write the answer (in other words, after doing the tables, clearly write $T'(13) = \_\_\_\_$, with your answer in the blank. Make sure your table(s) are neat and legible.

   b. Determine the percentage rate of change of swim time for a 13-year-old.

   c. Is a 13-year-old swimmer’s time improving or getting worse as the swimmer gets older?