**MAT 131**  Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Project #2, Individual Component**

**Due: see webpage**

**Directions:**

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* You must SHOW ALL WORK (including set-ups). Pay attention to details.
* **Do not round within an expression, wait until the end of each part.**
* **Round money values to the closest cent.**
* Remember to include units on final answers.
* The submitted work has to show your own understanding

# Finance, Individual Component

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Suppose you won $500,000 in the lottery! If you were to invest the money at 4.25% annual interest rate **compounded continuously**, how long would it take you to become a millionaire? *Round your number of years to one decimal place.*

1. Fill in the following list:

P = *A* = *r* =

Find the time:

$ 90000 is invested at an annual interest rate of 5% for 3 years compounded at certain intervals. Calculate the accumulated amount for each compounding example below.

1. Fill in the following list:

*P* = *r* = *t* =

1. Find the accumulated amount if the money is compounded quarterly. *Include the set-up*.

 Calculate the interest:

1. Find the accumulated amount if the money is compounded monthly. *Include the set-up*.

Calculate the interest:

1. Find the accumulated amount if the money is compounded daily, i.e. 365 times a year.

*Include the set-up*.

Calculate the interest:

1. Which of the three options above (quarterly, monthly, or daily) is in your best interest when you invest? Explain your understanding of **why** this results in the **most money gained**.
2. Which of the three options above (quarterly, monthly, or daily) is in your best interest when you take out a loan? Explain your understanding of **why** this results in the **least money owed**.

Credit cards use **daily compounding** (*n* = 365). If you don’t carry a balance, your credit card does not charge you interest. But if you don’t pay the amount you owe in full, the outstanding balance will accrue interest and a bill showing your outstanding debt will arrive in the mail the next month.

You purchase a TV for $1200 and put it on a credit card that charges you an annual 16% interest rate. When the bill arrives, you are able to pay $400, bringing the balance you owe down to $800. In your next monthly bill, the credit card company charges you interest on the $800 you left on the card. [Hint: Use for the time since a month is of one year. ]

1. Fill in the following list:

*P* = *r* = *n* = *t* =

1. How much do you owe according to this next bill? *Include the set-up*.
2. How much of this amount is interest? *Show the calculation*.
3. If they charged you this exact same amount in interest EVERY month, how much would you pay in interest over one year? *Show the calculation*.
4. Paying this same interest amount EVERY month, how much interest would you pay in 6¼ years?
5. Briefly **give your insights** about credit cards from this last problem.

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