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| **NAME:** |  |

**MATH125: Unit 2 Individual Project Answer Form**

**Number Sense, Estimation, and Financial Computations**

ALL questions below regarding CONSUMER CREDIT and SAVING FOR RETIREMENT must be answered. **Show ALL step-by-step calculations, round all of your final answers correctly, and include the units of measurement**. Upload this modified Answer Form to the Unit 2 Individual Project. Make sure you submit your work in a modified MS Word document; handwritten work will not be accepted. If you need assistance, please contact your course instructor.

**CONSUMER CREDIT**

For big purchases, many stores offer a deferred billing option (buy now, pay later) that allows shoppers to buy things now without paying the bill at checkout.

1. Assume you bought new appliances for your newly renovated home. Using the table range values below, choose one total value for the appliances that you have purchased based on the first letter of your last name. Denote this by *P*. It does not necessarily have to be a whole number.

|  |  |
| --- | --- |
| **First letter of your last name** | **Possible range values for *P*** |
| A–F | $4,000–$4,999 |
| G–L | $5,000–$5,999 |
| M–R | $6,000–$6,999 |
| S–Z | $7,000–$7,999 |

Type your chosen value here: **(4 points)**

|  |  |
| --- | --- |
| **Total value of the appliances, *P*** | $ |

1. The store where you bought these appliances offered you a provision that if you pay the bill within 3 years, you will not be charged any interest for your purchases. However, if you are even a day late in paying the bill, the store will charge you interest for the 3 years.

Choose an interest rate between 12% and 16%. Denote this by *r,* and convert your answer into decimal form. **(4 points)**

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| --- | --- |
| **Annual interest rate in decimal form, *r*** |  |

1. Suppose you forget about the bill and pay it 1 day late. How much interest do you pay if the store charges you simple interest? Because this is a dollar value, round your answer to the nearest cent. (Assume *t* = 3 years.)

|  |  |
| --- | --- |
| **Interest, *I*** | $ |

**Show and explain your work here: (5 points)**

1. How much is yourtotal bill—the total value of the appliances plus the interest? Round your answer to the nearest cent.

|  |  |
| --- | --- |
| **Total bill (simple interest)** | $ |

**Show and explain your work here: (5 points)**

1. How much is your total bill if, instead, the store charges you interest that is compounded daily? Use 6 digits on your intermediate calculations, and round your final answer to the nearest cent. (Assume *t* = 3 years.)

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| --- | --- |
| **Total bill (compound interest)** | $ |

**Show and explain your work here: (6 points)**

1. How much interest do you pay if it is compounded daily? Round your answer to the nearest cent.

|  |  |
| --- | --- |
| **Interest, *I*** | $ |

**Show and explain your work here: (5 points)**

1. Based on the result of your calculations, write a summary about the difference between simple and compound interest. Explain your answer. **(6 points)**
2. Do you think a deferred billing option is helpful for shoppers? Explain your answer. **(5 points)**

**SAVING FOR RETIREMENT**

Suppose your goal is to have a lump sum that you can withdraw when you retire. To accomplish this, you decided to contribute a portion of your paycheck to an annuity.

1. Using the AIU Library or the Internet, read about what kind of expenses you will be faced with when you retire. Write a brief summary of your research here: **(6 points)**

1. Based on your research, state the lump sum, in $U.S., that you want to have when you retire. This is the future value of your investment; denote it by *F*. **(4 points)**

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| **Future value, *F*** | $ |

1. State the time, in years, that you plan to contribute to your retirement account. Denote this by *t*. **(4 points)**

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| **Time, *t*** |  |

1. Based on the first letter of your last name, choose the annual interest rate for your retirement account from the chart below. It does not necessarily have to be a whole number. Denote this by *r*,and convert this to its decimal form.

|  |  |
| --- | --- |
| **First letter of your last name** | **Possible values for *r*** |
| A–F | 5.00%–6.99% |
| G–L | 7.00%–8.99% |
| M–R | 9.00%–10.99% |
| S–Z | 11.00%–12.99% |

**Type your chosen value here: (4 points)**

|  |  |
| --- | --- |
| **Annual interest rate in decimal form, r** |   |

1. From the table below, choose how many times per year you want to contribute to your retirement fund. Denote this by *n*, and this will also be your compounding period.

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| --- | --- |
| **Compounding Period** | ***n*** |
| Yearly | 1 |
| Semi-Annually | 2 |
| Quarterly  | 4 |
| Monthly | 12 |
| Weekly | 52 |

**Type your chosen value here: (4 points)**

|  |  |
| --- | --- |
| **Compounding period, *n*** |  |

1. Calculate the interest rate per compounding period, which you will denote by *i*, by dividing the annual interest rate from #4 by the compounding period from #5:

$$i=\frac{r}{n }$$

Round your answer to 6 decimal places.

|  |  |
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| **Interest rate per compounding period, *i*** |  |

**Show and explain your work here: (5 points)**

1. Your contribution per period, which you will denote by *C*, to this retirement account is calculated using the following formula:

$$C=\frac{F\*i}{\left(\left(1+i\right)^{(n\*t)}-1\right)}.$$

Using the values that you have chosen for *F*, *i, n,* and *t*, calculate your contribution per period. Use 6 decimal places for your intermediate calculations, and round your final answer to the nearest cent.

|  |  |
| --- | --- |
| **Contribution amount, *C*** | $ |

**Show and explain your work here: (6 points)**

1. Calculate your total contribution to this retirement account, which you will denote by *TC*, by using the formula TC = C x n x t.

|  |  |
| --- | --- |
| **Total contribution, *TC*** | $ |

**Show and explain your work here: (5 points)**

1. What can you say about the difference in value between your total contribution (*TC*) and the lump sum (*F*) that you will receive? Based on what you have learned in this unit, is there a term that is used for this difference?

**Show and explain your work here: (6 points)**

1. Summarize the results of your calculations, and explain why it is important to prepare for your retirement.

**Show and explain your work here: (6 points)**