Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Math 620 – B Block

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Linear vs. Exponential

1. You have $1000 saved. Would you rather earn $100 at the end of each year, or earn 10% of the money you have saved?

1. How much money you would have at the end of 5 years earning $100 at the end of each year? Assume that you do not spend any of your money saved. Complete the following table

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Starting Amount | Add $100 | Total at end of Year |
| 1 | $1000 | $100 | $1100 |
| 2 | $1100 |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

1. How much money you would have at the end of 5 years if you earned 10% of the money you save each year? Assume you do not spend any of your money saved. Complete the following table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Starting Amount | Multiply 0.10  (10% = 0.10) | Add 10% | Total at end of Year |
| 1 | $1000 | $100 | $1000 + $100 | $1100 |
| 2 | $1100 | $110 |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |

1. How can we express each scenario using a function?

2. After graduation, you are offered two jobs. Cedar Grove Associates offered to start you at $30,000 with a 5% increase per year. Maple Grove Associates offered to start you at $40,000 with a $1200 raise per year. Compare the two jobs offered by completing the table below. Answer the following questions.

|  |  |  |
| --- | --- | --- |
| **Year** | **Cedar Grove** | **Maple Grove** |
| 1 | $30,000 | $40,000 |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |
| 11 |  |  |
| 12 |  |  |
| 13 |  |  |
| 14 |  |  |

1. Cedar Grove models what type of function? Explain your reasoning.
2. Write a function that models the salary you earn at Cedar Grove for any given year. Be sure to define your variables.
3. Maple Grove models what type of function? Explain your reasoning.
4. Write a function that models the salary you earn at Maple Grove for any given year. Be sure to define your variables.
5. If you plan on moving in 5 years which company would be the better option for you to choose for the next 5 years? Explain our reasoning.
6. If your plans change and you don’t move, which company would be the better option to choose as a long-term career? Explain your reasoning.

3. Given the situations below, identify if it is a linear or exponential model or neither. Explain your reasoning, and write a function that models the scenario.

a. A savings account that starts with $5000 and receives a deposit of $825 per month.

b. The value of a house that starts at $150,000 and increases by 1.5% per year.

c. Tina owns 4 rabbits. She expects them to double each year.

d. The cost of operating Jelly’s Doughnuts is $1600 per week plus $.10 to make each doughnut.

e. The value of John’s car that depreciates (decreases) 20% per year