

Lesson 2.3 Notes

1. The hair on my head is already 2 feet long. It grows $\frac{1}{2}$ inch per month.

Is the relationship linear or exponential? Justify your choice. **Linear**

This relationship is linear because it has a constant rate of change or slope of $\frac{1}{2}$.

Is the relationship discrete or continuous? **Continuous**

Describe a reasonable domain for the function. **Positive Real Numbers**

Write the explicit function that would describe the situation.

$$f(x) = \frac{1}{2}x + 24$$

****You must convert the 2 foot length of hair to inches so that units match.**

2. Computafest has a net income of 2 million dollars. They develop a plan aimed at increasing its net income by 15% each year.

Is the relationship linear or exponential? Justify your choice. **Exponential**

This relationship is exponential because it has a constant growth factor of 1.15.

Is the relationship discrete or continuous? **Continuous**

Describe a reasonable domain for the function. **Positive Real Numbers**

Write the explicit function that would describe the situation.

$$f(x) = 1.15^x \cdot 2$$

****Remember that we want the company to be worth 115% of the previous year.**

3. The first term in a sequence is 100. The sequence decreases by 20% each term.

Is the relationship linear or exponential? Justify your choice. **Exponential**

This relationship is exponential because it has a constant growth factor of .80 (which is actually a decay factor).

Is the relationship discrete or continuous? **Discrete**

Describe a reasonable domain for the function. **Integers**

Write the explicit function that would describe the situation.

$$f(x) = 0.8^x \cdot 100$$

****Remember that we subtract the 20% from 100% to get the growth factor.**

4. Joe puts \$2,000 into a savings account that earns 0.6% interest.

Is the relationship linear or exponential? Justify your choice. Exponential

This relationship is exponential because it has a constant growth factor of 1.006.

Is the relationship discrete or continuous? Discrete

Describe a reasonable domain for the function. Positive Integers

Write the explicit function that would describe the situation.

$f(x) = 1.006^x \cdot 2,000$ **Remember that we want the bank account to be worth 100.6% of the previous term.

5. The population in the United States grew at a rate of 0.49% in 2020. That growth rate is expected to decrease by a factor of 36% per year.

Is the relationship linear or exponential? Justify your choice. Exponential

This relationship is exponential because it has a constant growth factor of .64 (which is actually a decay factor).

Is the relationship discrete or continuous? Continuous

Describe a reasonable domain for the function. Positive Real Numbers

Write the explicit function that would describe the situation.

$f(x) = .64^x \cdot 0.49$

**Note: This relationship could be categorized as either discrete or continuous depending on how you decide to interpret the situation. I chose to interpret that the growth rate will continue to decrease throughout the year and that being part way through the year might impact the growth rate. So, I chose continuous.