**Day 12: Comparing Functions Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Practice Assignment Block: \_\_\_\_\_\_\_**

1. A bicycle store has approximately 200 bicycles in stock. The store owner is considering plans for expanding its inventory.
	* Plan A: Increase by 30 bicycles per year
	* Plan B: Increase by 10% each year

|  |  |
| --- | --- |
| a. What type of function does Plan A represent?     | b. Create a function to represent Plan A:  |
| c. What type of function does Plan B represent?  | b. Create a function to represent Plan B:  |

e. When will the number of bicycles under Plan B exceed the number of bicycles under Plan A?

1. Consider the following functions regarding car depreciation.

**Car A**: The value of a car in dollars, f(x), depreciates after each year, x. The following table shows the value of a car for each of the first 4 years after it was purchased.



* + 1. Create an exponential model to represent the table.

* + 1. What is the car’s depreciation rate?

* + 1. What is the car’s starting value?

**Car B**: The value of a second car is modeled by the equation g(x) = 19,375(0.84)x, where g(x) represents the value of the car x years after the date it was purchased.

* + 1. What is the car’s depreciation rate? e. What is the car’s starting value?

**Compare:**

 f. Which car has more starting value? g. Which car is depreciating faster?

 h. Will Car A ever be worth less than Car B? Explain why or why not?

3. The gym offers 3 membership plans that represent a month’s membership:

**Pay As You Go**: $6 each time you work out

**Regular Deal**: $50 per month plus $2 each time you work out

**Unlimited Deal**: $100 per month for unlimited use.

* 1. Create an equation for each plan:

 Pay As You Go: Regular Deal: Unlimited Deal:

* 1. Interpret the slope for each plan in relation to the problem scenario.

 Pay As You Go: Regular Deal: Unlimited Deal:

* 1. Interpret the y-intercept for each plan in relation to the problem scenario.

 Pay As You Go: Regular Deal: Unlimited Deal:

* 1. After how many workouts is each plan the cheapest?

 Pay As You Go: Regular Deal: Unlimited Deal:

4. Determine if the following scenarios represent a linear or exponential function:

* + 1. A glass jar of jelly beans starts with 3,072 jelly beans. Each day, ¼ of the jelly beans disappear from the previous day’s amount.

* + 1. A new car is bought for $20,000. It is depreciating by $500 each year.

* + 1. A store is selling discounted jewelry each month. A necklace costs $80. Then the next month, it costs $72. The following month, the necklace costs $64.80. The necklace continues to be discounted by the same rate each month.

* + 1. Enrollment at a school is 976 students and declines 2.5% each year

* + 1. Amy’s salary is $40,000 in her first year and she receives a raise of $2000 each year.