Reasonable Domain and Range Classwork

1. A car rental company charges $10 an hour (a part of an hour rounds up to the next hour) to rent a car. The limit to the number of hours you can rent the car is 8 hours.

    a. Write a rule in function notation for this situation.

    $$f(x) = 10x$$

    b. If we graph this situation, will it be a discrete or continuous graph? Why?

    discrete- only pay on every hour

    c. What is a reasonable domain and range for this situation?

    D: $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$
    R: $\{0, 10, 20, 30, 40, 50, 60, 70, 80\}$

2. The American Sycamore tree grows approximately 6 feet per year until they reach a maximum height of about 66 ft.

    $$f(x) = 6x$$

    a. Write a rule in function notation for this situation.

    b. If we graph this situation, will it be a discrete or continuous graph? Why?

    Continuous - it doesn't stop growing at any point.

    c. What is a reasonable domain and range for this situation?

    D: $0 \le x \le 11$

    R: $0 \le y \le 66$

3. Mary earns $8 per hour proofreading advertisements for a local newspaper. She works 5 hours per day.

    a. Write a rule in function notation for how much Mary earns.

    $$f(x) = 8x \qquad x = \text{# of hours}$$

    b. If we graph this situation, will it be a discrete or continuous graph? Why?

    Discrete - only paid for whole # hours

    c. What is a reasonable domain and range for this situation?

    D: $\{0, 1, 2, 3, 4, 5\}$

    R: $\{0, 8, 16, 24, 32, 40\}$

4. Ms. Bolus was born 22 inches long and grew approximately 3 inches per year until she reached a maximum height of 5'1".

→ 61 inches

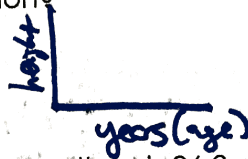a. Write a rule in function notation for Ms. Bolus' growth.

$$f(x) = 3x + 22$$

b. If we graph this situation, will it be a discrete or continuous graph? Why?

Continuous— continually growing

c. What is a reasonable domain and range for this situation?

D: $0 \leq x \leq 13$
R: $22 \leq y \leq 61$

[height] [years (age)]

5. The fastest marathon runner averages 13 miles every hour. A marathon is 26.2 miles total.

a. Write a rule in function notation that calculates the fastest runner's distance after x hours.

$$f(x) = 13x$$

b. If we graph this situation, will it be a discrete or continuous graph? Why?

Continuous — continually running

c. What is a reasonable domain and range for this situation?

D: $0 \leq x \leq 2.01$
R: $0 \leq y \leq 26.2$

6. Pedro is making chocolate chip cookies. He has a bag of chocolate chips that contains 140 chocolate chips. He is very particular about his cookies, so he makes sure that there are exactly 15 chocolate chips in each cookie.

$$f(x) = 140 - 15x$$

a. Write a rule in function notation to calculate the **number of chocolate chips left in the bag.**

b. If we graph this situation, will it be a discrete or continuous graph? Why?

discrete— you don't bake ½ of a cookie

c. What is a reasonable domain and range for this situation?

D: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$
R: $\{5, 20, 35, 50, 65, 80, 95, 110, 125, 140\}$

Functions & Relations Task

Mr. Allen loves Dr. Pepper. Absolutely loves it. While at the store, Mr. Allen has budgeted $35 to spend on soda and each bottle of Dr. Pepper is $2. Assume tax is already included in all of the prices.

1. Write a function for the total cost (not the money left).

2. Identify the independent and dependent variables. Justify your reasoning.

3. State a reasonable domain and range given the context of the problem.

   Domain:

   Range:

4. How do you know where to stop the domain? Why is this reasonable?

5. Is this function discrete or continuous? Be specific & justify your reasoning!

6. Evaluate $B(8)$. What is this as an ordered pair? What does this point represent in the context of the problem?

7. Create a table to represent all practical values for this function. (You may want to make your table horizontal to have enough space.)

8. Graph the data on the given graph. Be sure to label your x & y axis with units and choose an appropriate scale so that ALL of your data points fit the graph!
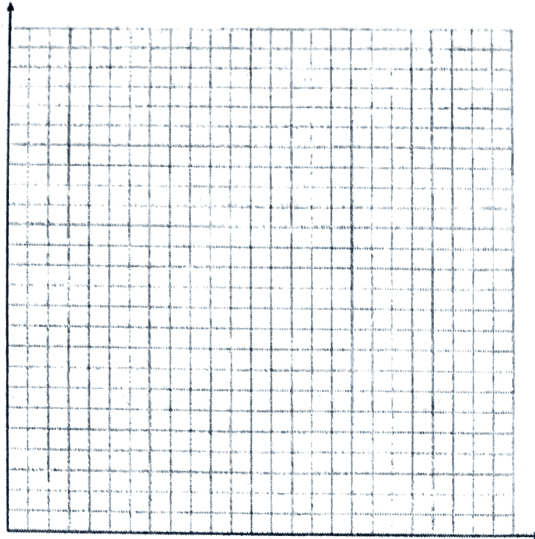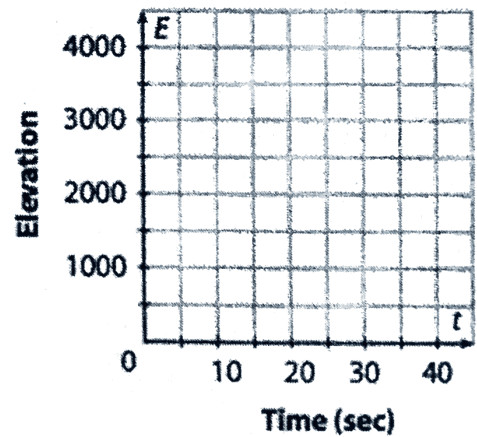
9. A snowboarder's elevation, in feet, can be represented by the function $E(t) = 3000 - 70t$, where t is in seconds.

a. Make a table for this situation. Pick your own values for t.

t	$E(t)$

b. Graph the function.

c. Find the domain and range.

d. Find the elevation of the snowboarder after 30 seconds.

10. Review: Graph a function that has a

domain of all real numbers and a range of $y \leq 2$