Four Situations

1. Sketch a graph to model each of the following situations.
   Think about the shape of the graph and whether it should be a continuous line or not.

   **A:** Candle
   Each hour a candle burns down the same amount.
   \( x = \) the number of hours that have elapsed.
   \( y = \) the height of the candle in inches.
   ![Candle Graph](image)
   Continuous

   **B:** Letter
   When sending a letter, you pay quite a lot for letters weighing up to an ounce. You then pay a smaller, fixed amount for each additional ounce (or part of an ounce.)
   \( x = \) the weight of the letter in ounces.
   \( y = \) the cost of sending the letter in cents.
   ![Letter Graph](image)

   **C:** Bus
   A group of people rent a bus for a day. The total cost of the bus is shared equally among the passengers.
   \( x = \) the number of passengers.
   \( y = \) the cost for each passenger in dollars.
   \( \frac{x}{2} = y \)
   ![Bus Graph](image)
   Discrete

   **D:** Car value
   My car loses about half of its value each year.
   \( x = \) the time that has elapsed in years.
   \( y = \) the value of my car in dollars.
   ![Car Value Graph](image)
   Continuous
Function
→ change?
→ input, output, linear lines

**D.** A function is a relation where every input has one output.

```
 x  | f(x)  |
```

- example: linear function (line)
- nonexamples: circle, ellipse

Features of functions

**D.** The domain is the set of allowable values that can go to the input of a function.
time is just positive.

\((-\infty, \infty)\) — exclusive

\([0, \infty)\) — inclusive

**D3**

the range is the set of output values (y-values)

**D4**

the y-intercept value where we cross the y-axis

→ algebraically happens when \(x=0\)

**D5**

the x-intercept(s) values where we cross the x-axis

→ algebraically happens when \(y=0\)