Definition

- A **function** is an input-output relationship. For each acceptable input there is exactly one corresponding output.
- The input variable is referred to as the **independent variable**.
- The output variable is called the **dependent variable** as it depends on the input.
- The **domain** of a function is the set of all acceptable inputs.
- The **range** of a function is the set of all possible outputs.

1. For each of the following relationships,
   - Determine whether they are functions.
   - Draw the corresponding graph, and use vertical line test to check your answer from the previous bullet.
   - Determine the domain and range if it is a function.
   
   (a) \( y = f(x) = x^2 \) 
   (b) Input: a positive number; Output: a number whose absolute value is the input.

   (c) | Input | Output |
   --- | --- | --- |
   1   | 1    |     |
   2   | 1    |     |
   3   | 2    |     |
Bottle Calibration – Solutions

1. (a) Function. Domain: \((−∞, ∞)\). Range: \([0, ∞)\).

(b) Not a function.

(c) Function. Domain: \(\{1, 2, 3\}\). Range: \(\{1, 2\}\).

(d) Not a function.