Properties of Functions

Terminology:

In mathematical relations, the domain and range are usually represented by variables, (often x and y).

When using x and y:

The variable of the _____ is _____.
It is known as the _____ variable.

The variable of the _____ is _____.
It is known as the _____ variable.

To illustrate:

x	y
-2	-7
-1	-4
0	-1
1	2
2	5

Tables of values:

Number of Tickets, n	Cost, C ($)
1	1.75
2	3.50
3	5.25
4	7.00
5	8.75

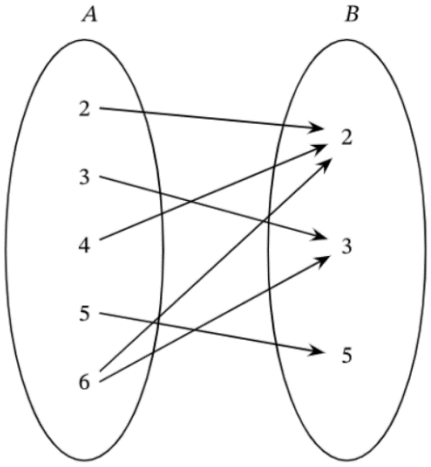
Domain:

Range:

Function? Y N

Properties of Functions

Arrow diagrams:



Domain:

Range:

Function? **Y** **N**

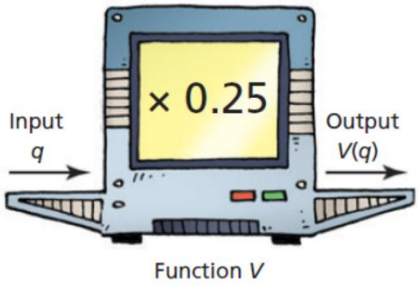
Function Notation:

We can think of a function as an input/output machine. The input can be any number in the domain, and the output depends on the input number.

So, the input is the _____ variable and the output is the _____ variable.

Consider a machine that accepts quarters and then calculates the value of the quarters:

- Machine A



Since every quarter has a value of $0.25, this function can be described with an equation that involves an independent variable "q" (input) that represents the number of quarters, and a dependent variable "V" (output) that represents the value of the number of quarters that was input:

$$\boldsymbol{V = 0.25q}$$

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Using **"function notation"** we can write this equation in a slightly different way:

$\boldsymbol{V(q) = 0.25q}$ This notation shows that **V is the dependent variable**
we say "V of q" and that **V depends on q**

The expression **V(5)** represents the value of the function when **q = 5**.
(What this means is we need to "calculate the value of the output when the input is 5".)

V(5) = *substitute and evaluate*

Example:

Write the following equations of functions using ***function notation***.
Identify the independent and dependent variables.

(1) $C = 25n + 1000$ (2) $y = -4x + 10$

Example: $\boldsymbol{f(x) = 3x + 5}$

Evaluate the following:

(1) $f(-2)$ (2) $f(0)$ (3) $f(12)$

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Example: $\boldsymbol{f(x) = 2x - 9}$

Determine the value of x:

(1) $f(x) = -1$

(2) $f(x) = 11$

Example:

The function $F(C) = \frac{9}{5}C + 32$ will convert a temperature in degrees Celsius into a temperature in degrees Fahrenheit.

What does $F(40)$ calculate?

What does $F(-3)$ calculate?

Calculate $F(40)$

Calculate $F(-3)$

Check your understanding: pg. 270 - 271, #6, 7, 9, 14, 15, 16, 17, 19