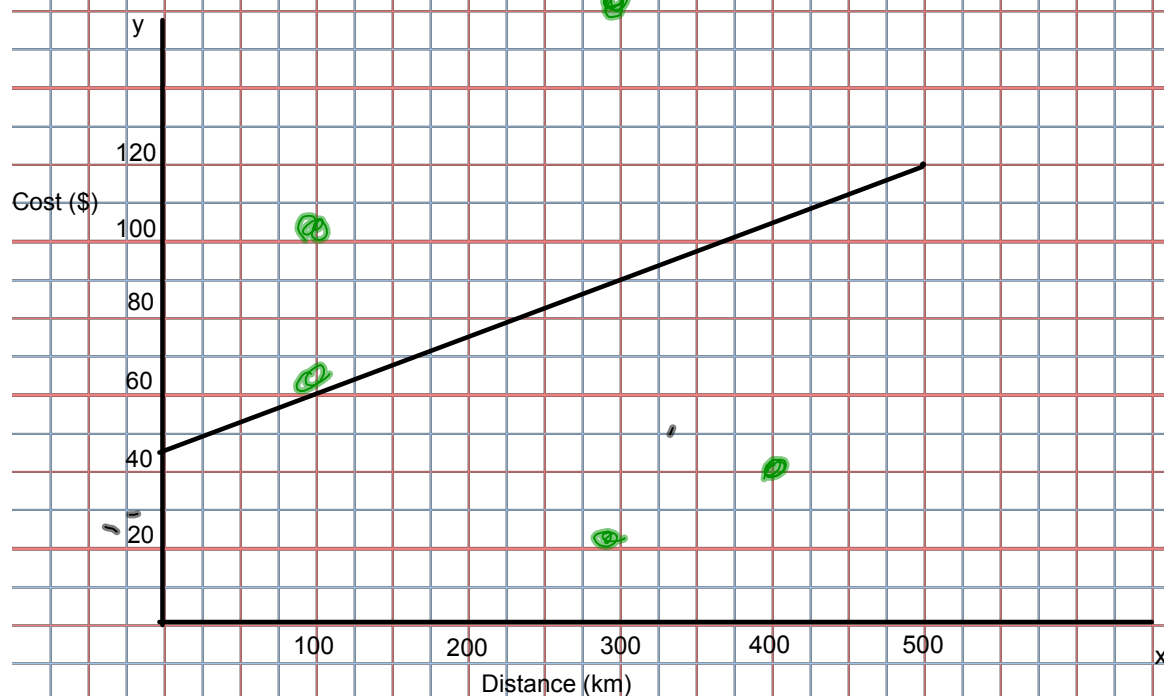


Did you understand yesterday's lesson???? Try this question to see.



The cost of renting a car depends on the daily rental charge and the number of kilometers driven. A graph of cost vs the distance driven over a one-day period is shown.

a) What are the domain and range of this relation?

distance
 $D = \{ 0 \leq x < 1500 | x \in \mathbb{R} \}$
 cost
 $R = \{ 45 \leq y < 270 | y \in \mathbb{R} \}$

b) Explain why the domain and the range have a lower limit.

Range has a lower limit
 since there is a flat rate

c) Is the relation a function? Explain.

$$C = 45 + 0.15(1500)$$

$$= 270$$

it
 So that is fair
 - everyone pays the same.

Function Notation

1.2

;

—

Sadia owns a lawn mowing company that charges
a flat cost of \$400 for the season

plus
\$2.20 per square metre of lawn

$$C = 400 + 2.2x$$

Sadia owns a lawn mowing company that charges
a flat cost of \$400 for the season
plus
\$2.20 per square metre of lawn

$$C = 400 + 2.20m$$

Sadia owns a lawn mowing company that charges
a flat cost of \$400 for the season
plus
\$2.20 per square metre of lawn

$$C = 400 + 2.20m$$

$$C = \$481.40$$

777
m . . .

Sadia owns a lawn mowing company that charges
a flat cost of \$400 for the season
plus
\$2.20 per square metre of lawn

$$C = 400 + 2.20m$$

$$C = \$481.40$$

Function
Notation

$$C(37) = \$481.40$$

indepent

dependent

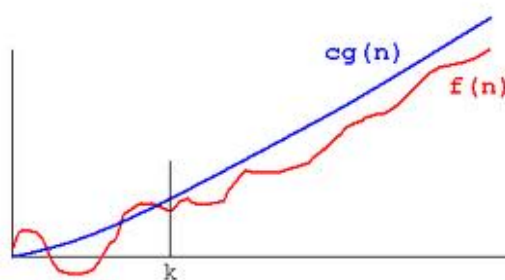
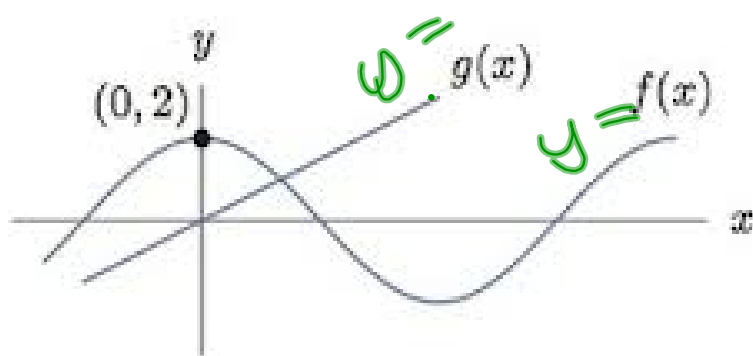
Sabrina owns a taxi service that charges
 a flat cost of \$5 for a trip
 plus
 \$1.50 per km

Use Function Notation to describe the cost of a 30km trip.

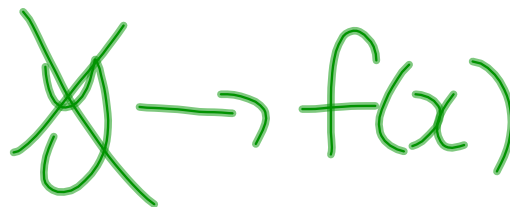
$$R \quad C(45) = 5 + 1.5x$$

$$MB \quad C(20) = 5 + 1.5x$$

$$\begin{aligned} C(30) &= 5 + 1.5x \\ C(30) &= 5 + 1.5(30) \\ C(30) &= 50 \\ 30 & \quad 30 \\ C(30) &= 50 \end{aligned}$$



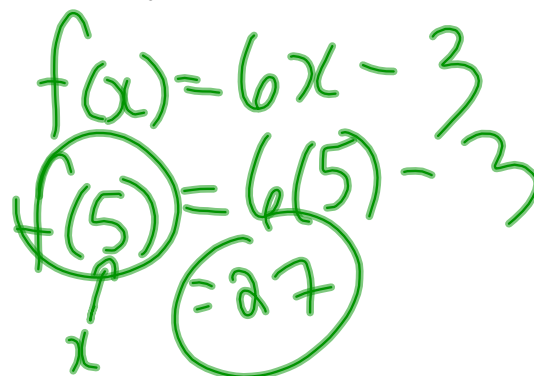
Function Notation: Notation, such as $f(x)$, used to represent the value of the dependent variable - the output - for a given value of the independent variable, x - the input.



A handwritten diagram in green ink. On the left, a 'y' is written and then crossed out with a large 'X'. An arrow points from the 'y' to the expression $f(x)$ on the right.

Example: Rewrite the following formula using function notation and then find the value of $f(5)$

$$y = 6x - 3$$



Handwritten work in green ink. The first line shows the function notation: $f(x) = 6x - 3$. The second line shows the evaluation: $f(5) = 6(5) - 3$. The 'f(5)' is circled, and an arrow points from the '5' to the 'x' in the function definition above. The final result, $= 27$, is also circled.

$$f(x) = x + 1$$

↑
 input
 >L
 independent variable

answer
 output
 dependent variable
 y

$$f(x) = 27$$

↑
 x

↑
 y

$$f(4) = 6$$

Example 1:

We are told that we can find the height of a student by using the formula, $h = 1.1l + 143.6$, where l is the foot length of the student.

- a) How do we know that the above formula represents a function.

- b) Write the function using function notation .

- c) What will be the height of a student whose footprint is 31 cm long?
(USE FUNCTION NOTATION).

Example 2:

Leema throws a ball in the air and determines that the equation

$$f(t) = -4.9t^2 + 1.9t + 1.1$$

can be used to determine the height in metres after t seconds.

a) Calculate the height of the ball when it was released.

b) Calculate the height of the ball after 1 second.

Example 3: For the function
 $g(x) = x^2 - 4x$, and $f(x) = 2 - 5x$

a) evaluate $g(-3)$

$$g(-3) = (-3)^2 - 4(-3) = 9 + 12 = 21$$

* b) simplify $g(a+1)$

$$g(a+1) = (a+1)^2 - 4(a+1)$$

e) find $g(3) - f(2)$

$$\begin{aligned} g(3) - f(2) &= (a+1)(a+1) - 4a - 4 \\ &= a^2 + a + a + 1 - 4a - 4 \\ &= a^2 + 2a + 1 - 4a - 4 \end{aligned}$$

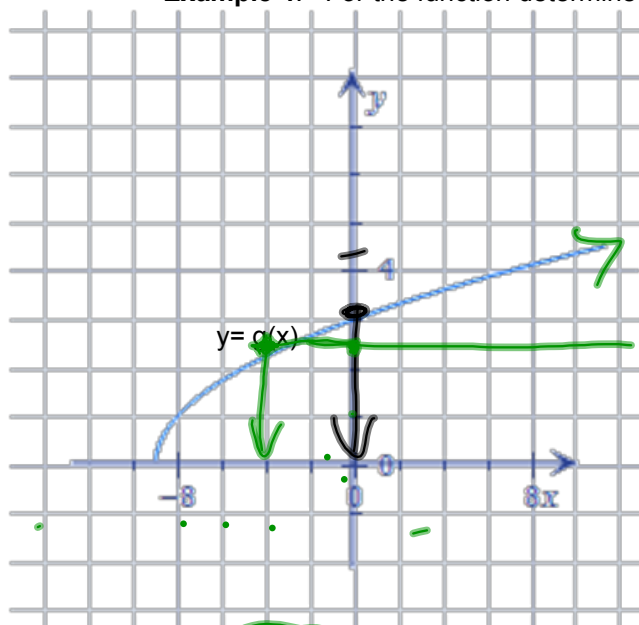
f) Show that $f(2) < g(2)$

$$= a^2 - 2a - 3 \quad \checkmark$$

c) graph g .

d) find the domain and range of g .

Example 4: For the function determine the following.



a) $g(-8)$

b) x if $g(x) = 3$

c) the domain and range of $g(x)$

$g(x) = \begin{cases} \text{curve} & x < -4 \\ 2.3 & -4 \leq x < 3 \\ \text{ray} & x \geq 3 \end{cases}$

$x = -4$
 $(-4, 2.3)$

$D: \{x \mid x \in \mathbb{R}\}$

$R: \{y \mid y \in \mathbb{R}\}$

Example 5: A family played a game to decide who got to eat the last piece of pizza. Each person had to think of a number, double it, and subtract the result from 12. Finally, they each multiplied the resulting difference by the number they first thought of. The person with the highest final number won the pizza slice.

a) Use function notation to express the final answer in terms of the original number.

b) The original numbers chosen by the family members are shown. Who won the pizza slice?

Suzette	5
Ayoub	-2
Allana	7
Rami	10

c) What would be the best number to choose? Why?

Example 6:

What is the domain
of $y = \sqrt{x-4}$?

What is the
range?

HOMEWORK: pg 22
#1-13, 15,16,17