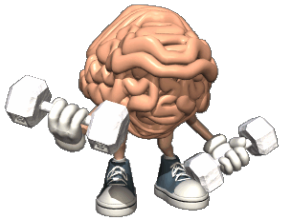
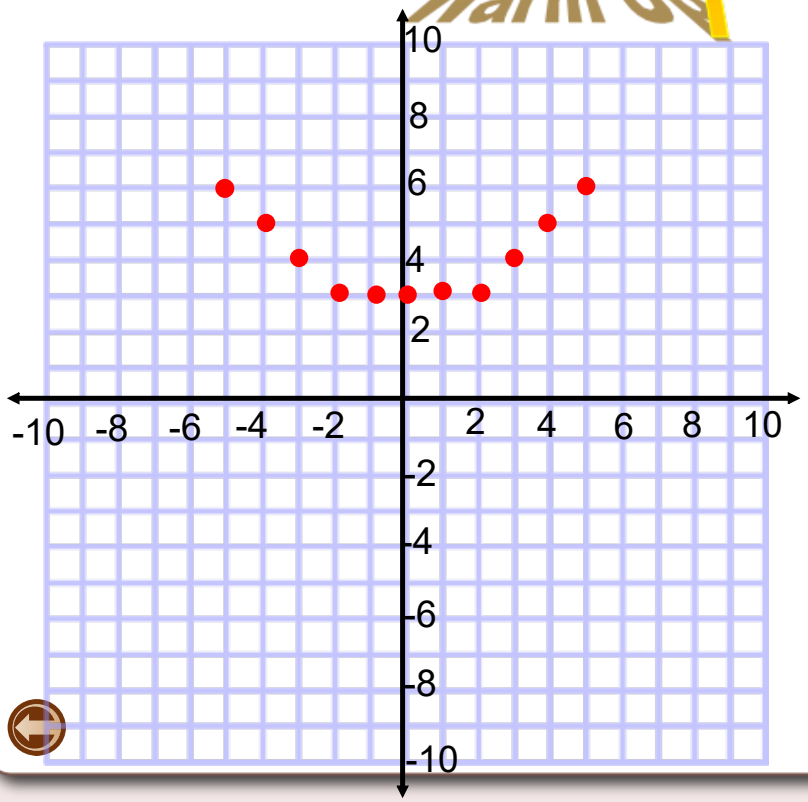
Warm Up





Domain

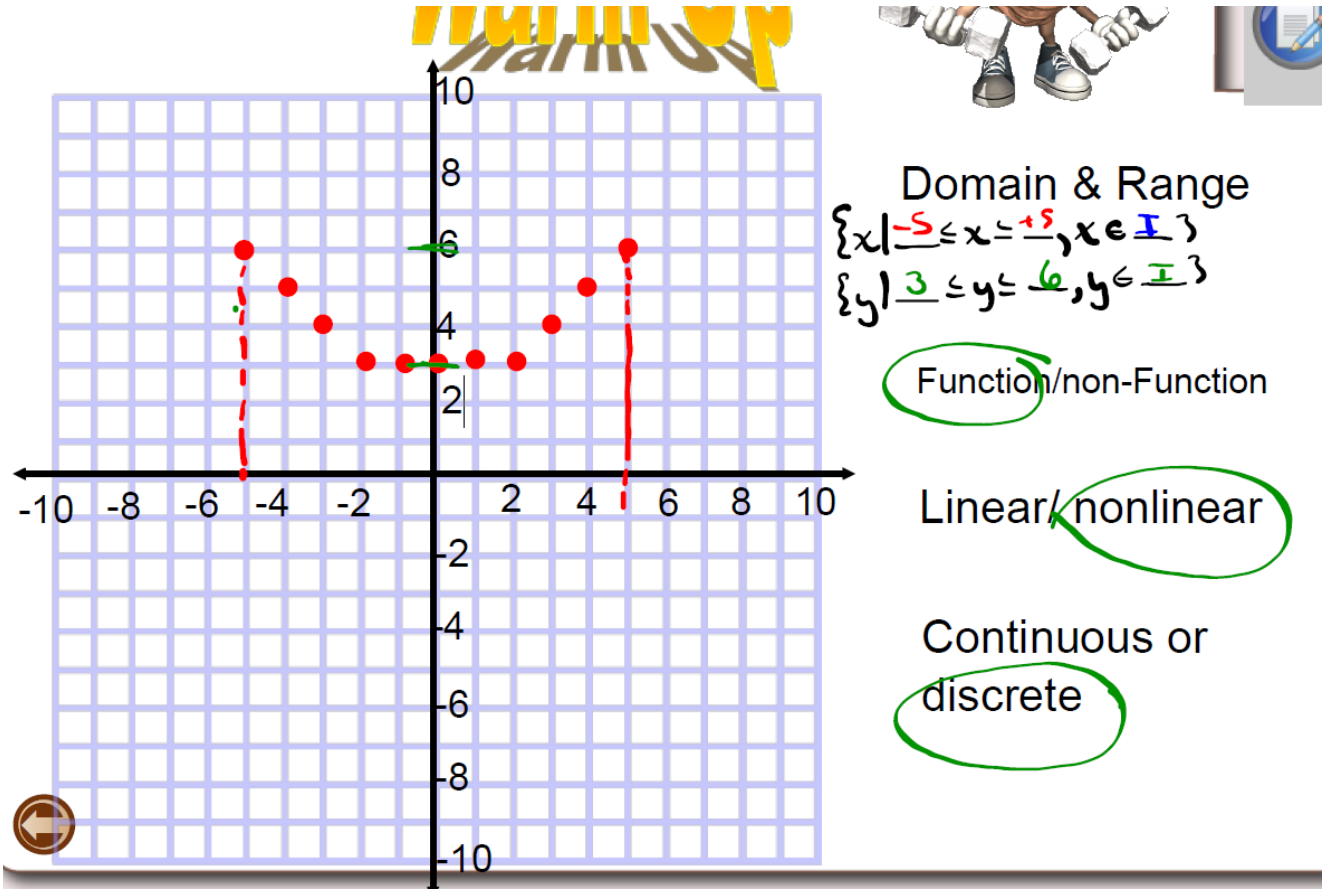
Range

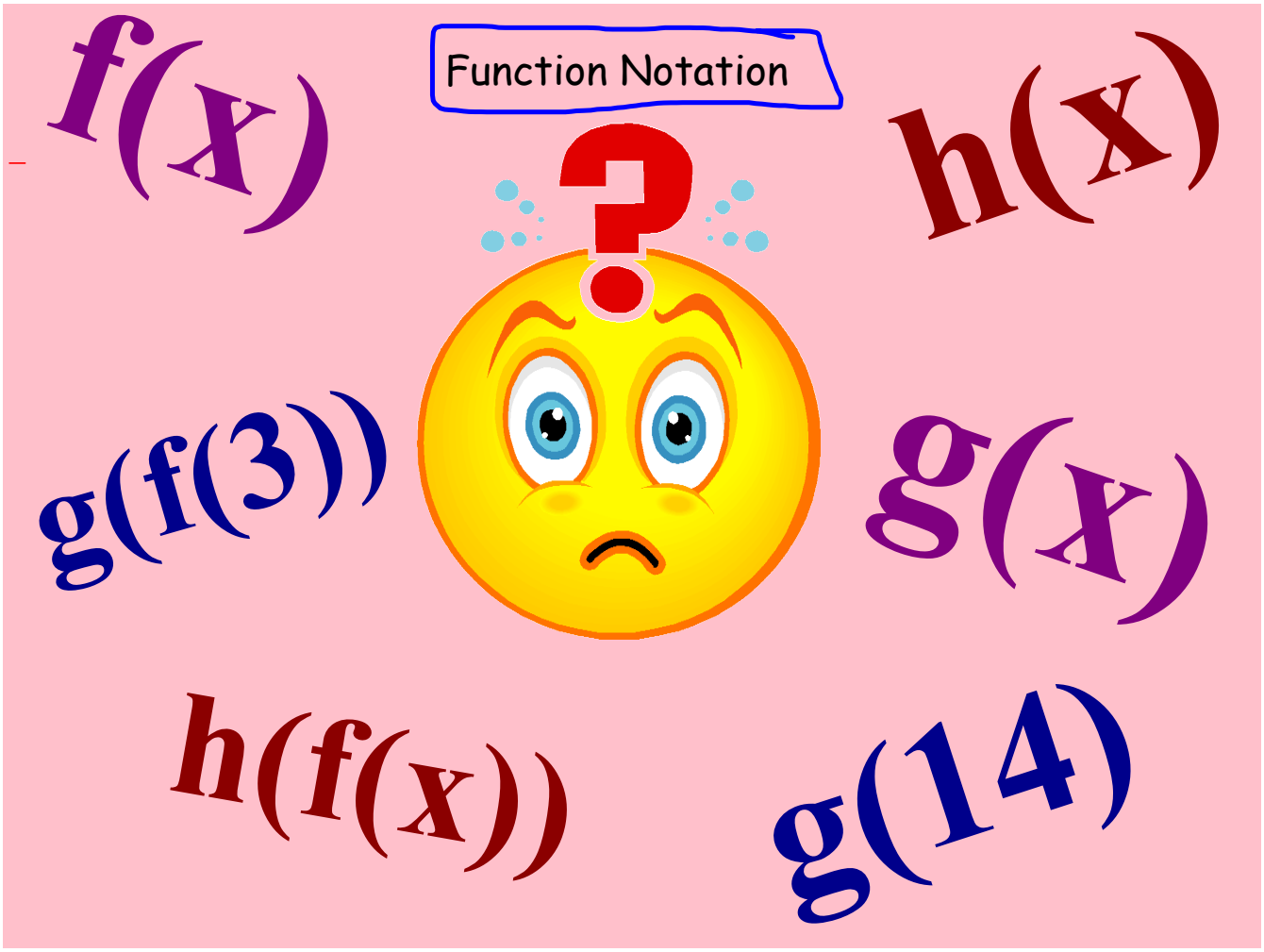
Function / Non-Function

Linear / Non-Linear

Continuous / Discrete

Solution to warm up




f(x)
Function Notation
h(x)
g(f(3))
g(x)
h(f(x))
g(14)

From middle school

a)Find the value of y for the equation y=2x +7, if x= 5

y = 2x +7

So the ordered pair is

b) Find the value of x, if the y= -25 for y= -9x - 7

y = -9x - 7

so the ordered pair is ( )

Try this one

1) Evaluate $y = x^2 - 10$, for $x = 4$

=

=

=

2) Given $y = x^2 - 10$, solve for x if y = 134

=

=

=

=

=

( ) or ( )

Function Notation

Function notation is the way a function is written. It is meant to be a precise way of giving information about the function without a rather lengthy written explanation.

The most popular function notation is f (x) which is read "f of x". This is NOT the multiplication of f times x..

$$f(x) = \underbrace{3x+1}_{\text{output value}}$$

(x: input value)

This means the value of the function 3x+1 when x is inputted

Traditionally, functions are referred to by single letter names, such as f, g, h and Any letter(s), however, may be used to name a function. Examples:

$$f(x) = x^2 + 1 \qquad g(x) = x - 7 \qquad h(b) = 3b^2 - 2b + 1 \qquad S(t) = \frac{1}{2}t^2 - 3t + 1$$

$$abs(-5) = 5 \qquad george(x) = x^{23}$$

The f (x) notation is another way of representing the y-value in a function, y = f (x).

The y-axis may even be labeled as the f (x) axis, when graphing. Ordered pairs may be written as (x, f (x)), instead of (x, y).

Equations

Often in working with a formula we may need to substitute more than one value for the variable.

Example

The cost, c, in cents for making pencils is given by the formula

$$C=5+2n$$

C Cost in cents

n number of pencils made

The cost depends on the number of pencils you buy

Function

A function is just an expression evaluated at a specific value

The cost, c, in cents for making pencils is given by the formula

$$C(n) = 5 + 2n$$

C(n) Cost in cents of "n" penciles

n number of pencils made

The cost depends on the number of pencils you buy

Try this on your own!!!!!!!!!!!!!!!

Example

The equation V= -0.08d + 50 represents the volume, V liters, of gas remaining in a vehicle's tank after travelling d kilometers. The tank is not filled until it is empty.

a) Describe the function.
Write the equation in function notation.

1. Given the function $f(x) = 3x - 5$, find $f(4)$.

f(x) = 3x - 5

=

=

=

order pair

2. Find the value of $h(b) = 3b^2 - 2b + 1$ when $b = -3$ and $b = 2$

h(b) = $3b^2$ - 2b +1

=

=

=

order pair is ( )

h(b) = $3b^2$ - 2b +1

=

=

=

=

order pair is (2, 9)

3) Given the equation p = 3x-4

a) Write as function notation.

b) Find the value of p(20).

c) if p(x) = -37 find x?

4) if $d(m) = -3m^2 - 5$ and $r(t) = 10t - 6$, Find $r(d(3))$

Function Notation

Recap

- To represent functions, we use symbols like f(x) and g(x).

- The symbol f(x) is read "f of x" and simply means that the expression that follows involves x.

Complete for Homework

Evaluating Functions

Show all work

1) *If* $f(x) = 3x^2 - x - 6$, *find*...

a) $f(5)$

b) f(-7)

c) f(-3)

2) If g(x) = x + 3 and h(x) = -3x-2

a) g(5) b) g(7) c) h(-10) d) h(5)

e) g(h(4)) f) g(x) = 33 g) h(x)= -41

Homework

These are the functions

$f(x) = -2x + 3$ $g(x) = 3x^2 + 4$

$h(x) = 5(x-1)$

Use the above functions to evaluate the following

a) **f(2)**

b) **f(x) = 31**

c) **g(f(5))**

d) **h(8) -f(1)**

e) **g(x) = 80**

Solutions for Homework

Evaluating Functions

Show all work

1) *If* $f(x) = 3x^2 - x - 6$, *find*...

a) $f(5)$

b) f(-7)

c) f(-3)

SOLUTIONS

a) $f(x) = 3x^2 - x - 6$

$f(5) = 3(5)^2 - 5 - 6$

$= 3(25) - 5 - 6$

$= 75 - 5 - 6$

$= 64$

b) $f(x) = 3x^2 - x - 6$

$f(-7) = 3(-7)^2 - -7 - 6$

$= 3(49) - -7 - 6$

$= 147 - -7 - 6$

$= 147 + 7 - 6$

$= 148$

c) $f(x) = 3x^2 - x - 6$

$f(-7) = 3(-3)^2 - -3 - 6$

$= 3(9) - -3 - 6$

$= 27 - -3 - 6$

$= 27 + 3 - 6$

$= 24$

2) If g(x) = x + 3 and h(x) = -3x-2

a) g(5) b) g(7) c) h(-10) d) h(5)

e) g(h(4)) f) g(x) = 33 g) h(x)= -41

SOLUTIONS

a) g(x) = x + 3

g(5) = 5 + 3

= 8

b) g(x) = x + 3

g(7) = 7 + 3

= 10

c) h(x) = -3x-2

h(-10) = -3(-10) - 2

= 30 - 2

= 28

d) h(x) = -3x-2

h(5) = -3(5) - 2

= -15 - 2

= -17

e) g(h(4))

h(x) = -3x-2

h(4) = -3(4) - 2

= -12 - 2

= -14

g(-14) = x + 3

g(-14) = -14 + 3

= -11

f) g(x) = 33

g(x) = x + 3

33 = x + 3

33- 3 = x + 3-3

30 = x

g) h(x) = -41

h(x) = -3x-2

-41 = -3x - 2

-41 + 2 = -3x -2+2

-39 = -3x

$\frac{-39}{-3} = \frac{-3x}{-3}$

13 = x

Solution to Homework

a) f(2)

$f(x) = -2x + 3$

$f(2) = -2(2) + 3$

$-4 + 3$

$f(2) = -1$

x y

(x, y)

$(2, -1)$

b) f(x) = 31

$f(x) = -2x + 3$

$31 = -2x + 3$

isolate x

$31 - 3 = -2x + 3 - 3$

$28 = -2x$

$\frac{28}{-2} = \frac{-2x}{-2}$

$-14 = x$

(-14, 31)

Solution to Homework

c) $g(f(5))$

start inside find answer then find g (answer of f(5))

$f(x) = -2x + 3$

$f(5) = -2(5) + 3$

$= -10 + 3$

$f(5) = -7$

$g(-7) = 3x^2 + 4$

$= 3(-7)^2 + 4$

$= 3(49) + 4$

$= 147 + 4$

$g(-7) = 151$

Solution to Homework

d) h(8) -f(1)

$h(x) = 5(x-1)$

$h(8) = 5(8-1)$

$h(8) = 5(7)$

$h(8) = 35$

$f(x) = -2x+3$

$f(1) = -2(1)+3$

$f(1) = -2+3$

$f(1) = 1$

So

$h(8) - f(1)$

$35 - 1$

$\boxed{34}$

e) g(x) = 80

$g(x) = 3x^2 + 4$

$80 = 3x^2 + 4$

Solve for "x"

$80 - 4 = 3x^2 + 4 - 4$

$\frac{76}{3} = \frac{3x^2}{3}$

$25.3 = x^2$

$\sqrt{25.3} = \sqrt{x^2}$

$\pm 5.03 = x$