

Functions

A rule that represents a trend

It's like a computer program: If we input a value we will get a result.

We can use it to predict what

a) has already happened

b) is happening

c) what will happen

Apr 25-7:08 AM

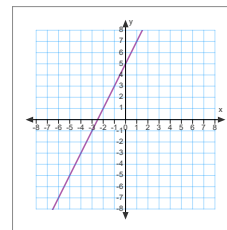
Functions represent any rule where there is only one possible answer for any input value: (x)

We can show them in different forms

-algebraically ex: $y=2x+5$

-graphically

$$y = 2x + 5$$



Apr 25-7:12 AM

We know the linear function (rule) already

$$y = ax + b$$

Function notation: $f(x) = ax + b$

y Means the same thing as "y"

$f(5)$ Replace x with 5 and solve

$f(5) = \#$ Replace f(x) (or y) with 5 and solve for x.

example

$$y = \frac{f(x)}{5} = 2x - 7$$

$$y = 2x - 7 \rightarrow y = 3$$

$$5 = 2x - 7$$

$$5 + 7 = 2x$$

a) solve for $f(5)$

b) solve for x if $f(x) = 5$

Apr 25-7:10 AM

Intervals

Brackets

Interval Notation

[included]

When the brackets are wrapped around a number, it means that number is included.

]excluded[

When square brackets are turned away from a number, it means that the number is excluded.

[2,5] includes both 2 and 5 and everything in between

] 2,5 [excludes both 2 and 5, but includes everything in between.

Things to remember:

Infinity is always excluded

[3, +∞ [

This means including 3 to positive infinity.

Jan 31-6:12 AM

Representing Intervals with Inequalities

Intervals can also be represented using inequalities.

\leq and \geq mean included

$<$ and $>$ mean excluded

For example...

$$[3,7] = 3 \leq x \leq 7$$

$$]3,7[= 3 < x < 7$$

$$[3,7[= 3 \leq x < 7$$

$$]3,7] = 3 < x \leq 7$$

The inequality symbol

$<$ less than

$>$ greater than

\leq less than or equal to

\geq greater than or equal to

$< =$ not including

$\leq =$ including the symbol always points to the smaller value

$5 > 3$ 5 is greater than 3

x is in between 3 and 7

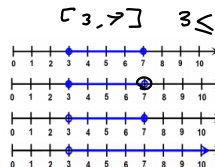
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Intervals on a Number Line

○ Open dots mean excluded

● Closed dots mean included

write the interval using a) brackets b) inequalities



$$[3,7] \quad 3 \leq x \leq 7$$

$$]3,7[\quad 3 < x < 7$$

Jan 31-6:21 AM

On a graph: The vertical line test

The vertical line test is a good way to check whether a relation is a function IF you are looking at the Cartesian graph of the relation. The test states that...

In a function, any vertical line drawn will intersect the function at most once. If it intersects more than once, it's not a function.

This is a function. This is NOT a function.

Jan 31-6:24 AM

Independent and Dependent Variables

An independent variable is a variable that stands alone. It is not changed by the other variables you are trying to measure.

A dependent variable depends on the other factors you are trying to measure. For example...

You get paid \$15 per hour. The amount of money you earn depends on the number of hours you work. The independent variable is time in hours and the dependent variable is the amount of money you earn.

Jan 31-6:25 AM

$[1, 3]$ (L-R)

Domain = $] -\infty, \infty [$

Range = $[-1, 5]$

(B-T)

Jan 31-3:46 PM

$D =] 2, +\infty [$

Feb 6-3:47 PM