(0, 4)
(1, 6)
(2, 8)
(5, 14)
(-1, 2)
(-3, -2)

+2

+2 ×2

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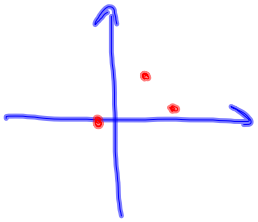
13.1 Relations and Functions

Relation: set of ordered pairs (points) {(2,3) (4,1) (-1,0)}

Domain: set of all first (x) coordinates {2, 4, -1}

Range: set of all second(y) coordinates {3, 1, 0}



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Function: a relation where no two ordered pairs (points) have the same first (x) coordinate

{(2,6)(3,1)(2,8)}

{(3,2)(2,2)(1,2)}

$y = 2x + 1$ (1, 3), (-2, -3), (0, 1)

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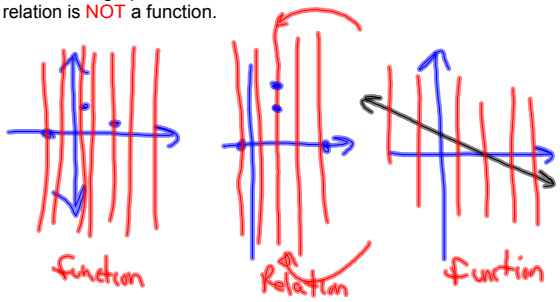
13.2 Identifying Functions

vertical line test: If you can draw a vertical line that crosses the graph more than one time, then the relation is NOT a function.



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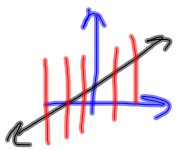
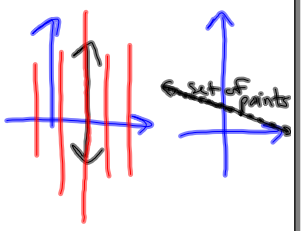
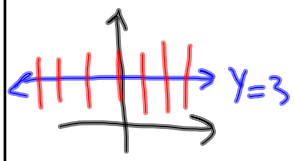
Linear Function: Non-vertical straight line





Constant function: Horizontal line



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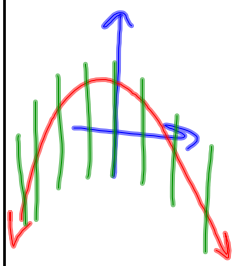
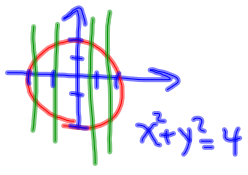
non-linear function



non-linear relation



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13.3 Standard Function Notation

If we call the function "f", and (x,y) is an ordered pair that is part of the function, the we say:

The ***value*** of ***f*** at ***x*** is ***y***

We write it like this:

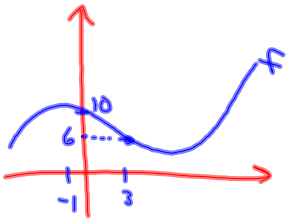
f(x)=y

f(3)=6

"y equals F of x"

f

(3, 6)



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$g(x) = 3x-6$

$g(2) = 3(2)-6$

$g(2) = 0$

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$g(x) = 3x+6$ $f(x) = 2x-1$

$f(2) = 3$

$g(2) = 12$

$f(g(2)) = f(12) = 23$

Composition

$g(f(2)) = g(3) = 15$

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13.4 Direct Variation

- one value increases and the other does the same.
- one value decreases and the other does the same.
- The quotient of the variables is always the same

$\frac{y}{x} = \frac{6x}{x}$

$\frac{y}{x} = 6$

(1, 6)
(2, 12)
(3, 18)

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13.5 Inverse Variation

one value increases as the other decreases.
The product of the variables is always the same

$y = \frac{3}{x}$ x

$yx = 3$

↳ constant of variation

(1, 3)
(2, 1.5)
(3, 1)

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13.6 Age Problems

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Homework:
Pg 384
#1,3,14,19,21,23,24

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