M10 - 6.0 - Graphing Notes

Graph:

$y = x$

x	y
-2	
-1	
0	
1	
2	

x	y
-2	-2
-1	-1
0	0
1	1
2	2

Ordered Pairs

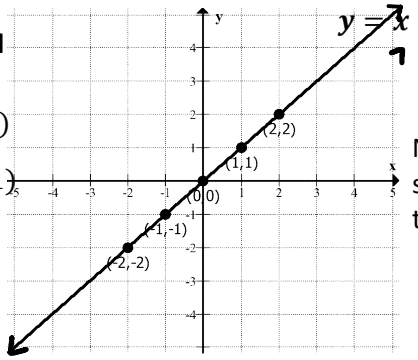
$(-2,-2)$

$(-1,-1)$

(0,0)

(1,1)

(2,2)



Notice the slope is up to the right

$y = x$
$y = (-2)$
$(-2,-2)$

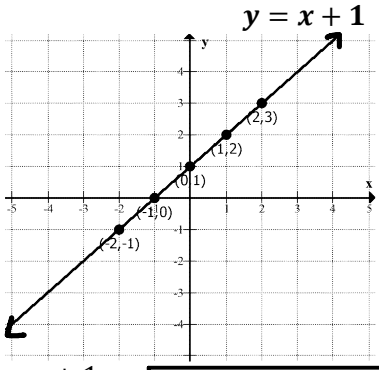
$y = x$
$y = (-1)$
$(-1,-1)$

(Substitute with Brackets)

OR Do it in your head!

$y = x + 1$

x	y
-2	-1
-1	0
0	1
1	2
2	3



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

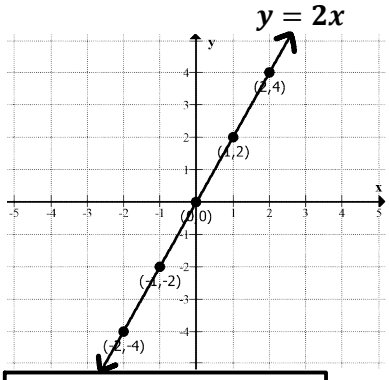
$y = x + 1$
$y = (-1) + 1$
$y = 0$
$(-1,0)$

Notice: the graph of $y = x + 1$ is the graph of $y = x$, moved up 1. (Or Left One*)

$y = 2x$

x	y
-2	-4
-1	-2
0	0
1	2
2	4

$y = 2x$
$y = 2(-2)$
$y = -4$
$(-2,-4)$

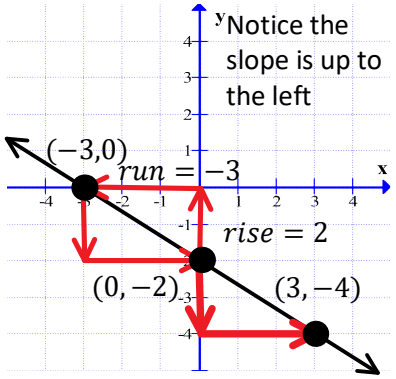


Notice: the graph of $y = 2x$ is twice as steep as the graph of $y = x$.

$y = -\frac{2}{3}x - 2$

x	y
-3	0
0	-2
1	$-\frac{8}{3}$
3	-4

Increments of x by denominator of slope away from zero. Or y-coefficient*.



$y = -\frac{2}{3}x - 2$

$y = -\frac{2}{3}(-3) - 2$

$y = 2 - 2$

$y = 0$

$y = -\frac{2}{3}x - 2$

$y = -\frac{2}{3}(1) - 2 \times \frac{3}{3}$

$y = -\frac{2}{3} - \frac{6}{3}$

$y = -\frac{8}{3}$

$y = -\frac{2}{3}x - 2$

$y = -\frac{2}{3}(3) - 2$

$y = -2 - 2$

$y = -4$

$y - \text{int} : (0, y) \quad x = 0$

put zero in for x and solve

$y = -\frac{2}{3}x - 2$

$y = -\frac{2}{3}(0) - 2$

$y = 0 - 2$

$y = -2$ $(0,-2)$

$x - int : (x, 0) \quad y = 0$

put zero in for y and solve

$y = -\frac{2}{3}x - 2$

$0 = -\frac{2}{3}x - 2$

$+2 \qquad +2$

$2 = -\frac{2}{3}x$

$3 \times 2 = -\frac{2}{3}x \times 3$

$6 = -2x$

$\frac{6}{-2} = \frac{-2x}{-2}$

$-3 = x$ $(-3,0)$

Notice: the graph of $y = -\frac{2}{3}x - 2$ has a:

$y - \text{intercept} = -2$

$slope = \frac{rise}{run} = -\frac{2}{3}$

M10 - 6.0 - Function Notation Notes

Vertical

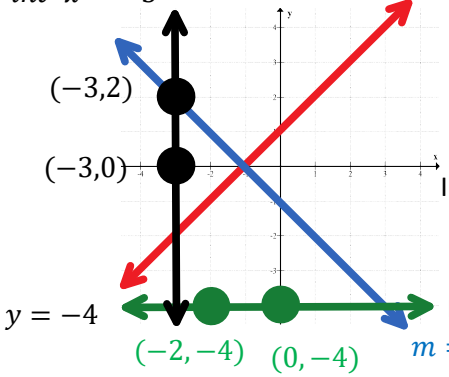
$m = (Und)efined$

$y - axis:$
$x = 0$
Infinite
y − intercepts

Up to Right

$m = +(Positive)$

$No\ y - int\ \ x = -3$



$x - axis: y = 0$
Infinite $x-intercepts$

$y = -4$

Down to Right

$m = +(Negative)$

(Up to Left)

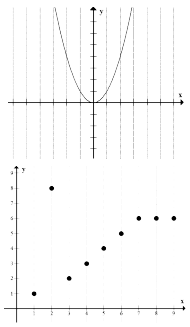
Flat - Horizontal

$m = 0\ (Zero)$

$No\ x - int$

Each x value only has one y value

Is a function

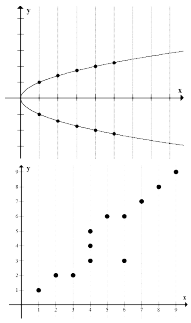


x	y
1	1
2	2
4	3
5	6

$(0,1), (1,2), (2,3), (3,3), (4,5)$

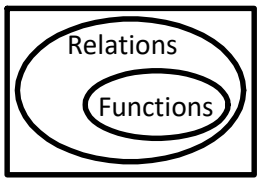
A **Relation** is a **Function** if you run your pencil vertically along the page and only cross the line once.

Not a function



x	y
1	1
2	3
2	5
3	9

$(0,1), (1,2), (1,3), (2,4), (3,5)$



$f(THAT) = ?$

$Put\ (THAT)\ in\ for\ f's\ x$

Put it in for x and solve for y or put it in for y and solve for x (Or from a graph)!

Variable Notation

x	y
−2	6
0	
2	

$y = x + 8$
$y = (-2) + 8$ Put $-2\ in\ for\ x$
$y = 6$ Substitution
Repeat

Function Notation
$f(x) = x + 8$

$f(-2) = ?$
$f(x) = x + 8$
$f(-2) = (-2) + 8$ Put $-2\ in\ for\ x$
$f(-2) = 6$
$y = 6$

$y = 6, x = ?$
$y = x + 8$
$6 = x + 8$
$-8 \quad -8$ Put $6\ in\ for\ y$
$x = -2$

$f(x) = 6, x = ?$
$f(x) = x + 8$
$6 = x + 8$
$-8 \quad -8$ Put $6\ in\ for\ f(x)$
$x = -2$

Write in Function Notation

$A = \pi r^2$

$A(r) = \pi r^2$

Write in Variable Notation

$C(n) = 10n + 200$

$C = 10n + 200$

$C = 2\pi r, A = \pi r^2; d = 2r$
Write $C(d)$ & $A(d)$

$d = 2r$

$\frac{d}{2} = \frac{2r}{2}$

$r = \frac{d}{2}$

$C = 2\pi r$

$C(d) = 2\pi\left(\frac{d}{2}\right)$

$C(d) = \pi d$

$A = \pi r^2$

$A(d) = \pi\left(\frac{d}{2}\right)^2$

$A(d) = \frac{\pi d^2}{4}$