2.1. Graphs of Equations

Thursday, August 30, 2018 12:56 PM

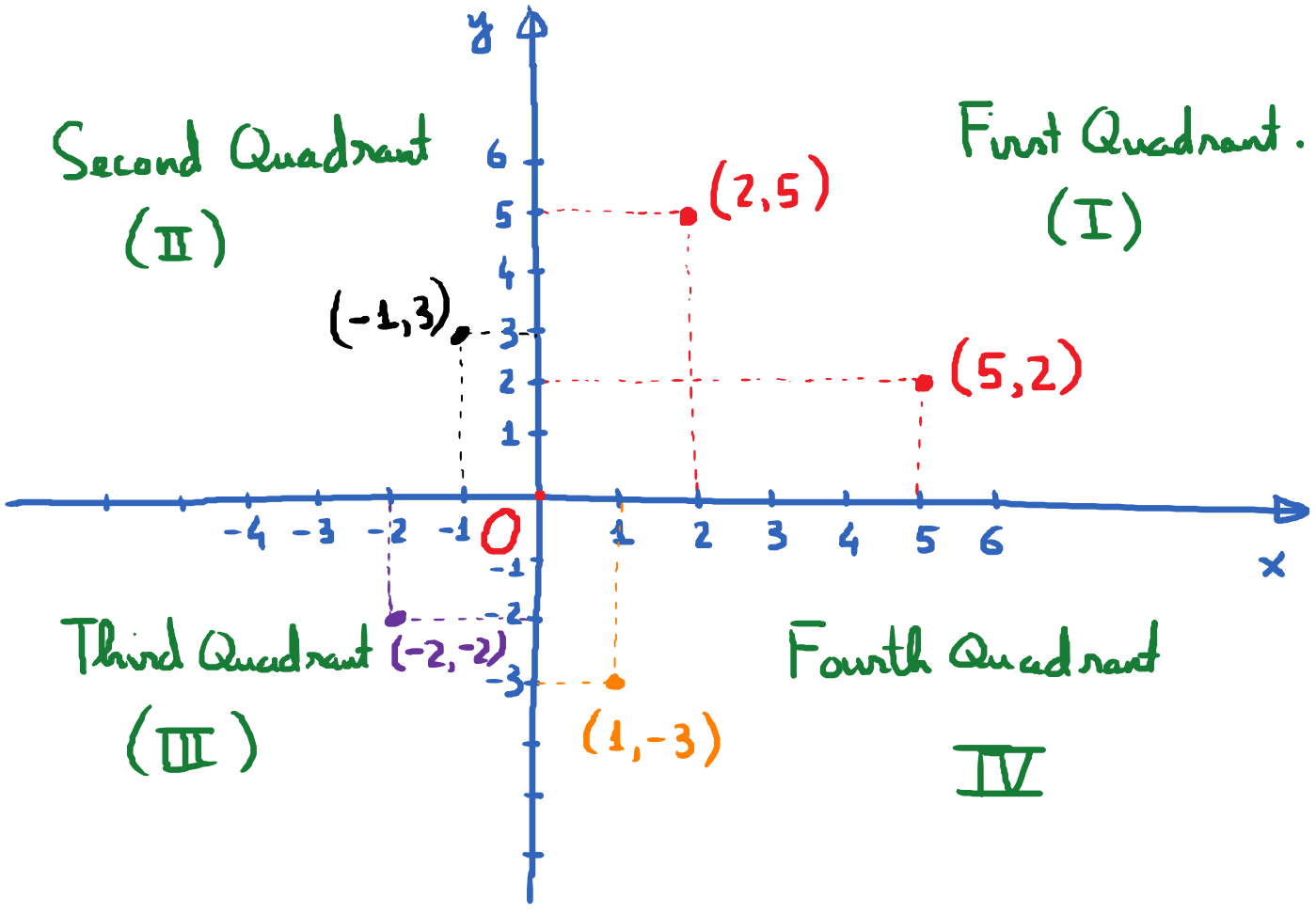
Objectives: (1) Plotting ordered pairs

(2) Solutions of Equations

(3) Graphing Linear Equations

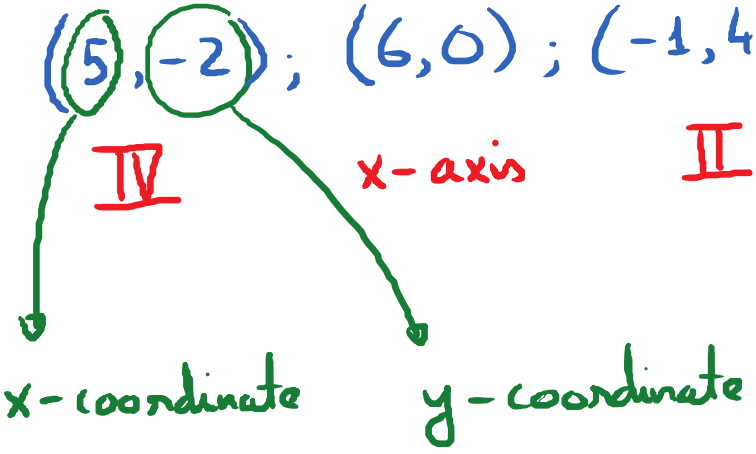
(4) Graphing Nonlinear Equations

(1)



E.g. In which quadrant, if any, are the points $(-3,-1)$; III

$(5,-2)$; $(6,0)$; $(-1,4)$ located?



(2) Solutions of Equations:

E.g. $4x - 3y = 12$

Is $(0,-4)$ a solution of this equation? YES

Is $(1,2)$ a solution of this equation? NO

* Plug $x=0$ and $y=-4$ into the equation:

$$4\cdot(0) - 3\cdot(-4) \stackrel{?}{=} 12$$

$$12 = 12 \checkmark$$

* Plug $x=1$; $y=2$ into the equation:

$$4\cdot 1 - 3\cdot 2 \stackrel{?}{=} 12$$

$$-2 \neq 12$$

(3) Graphs of linear Equations

Process for graphing linear equations.

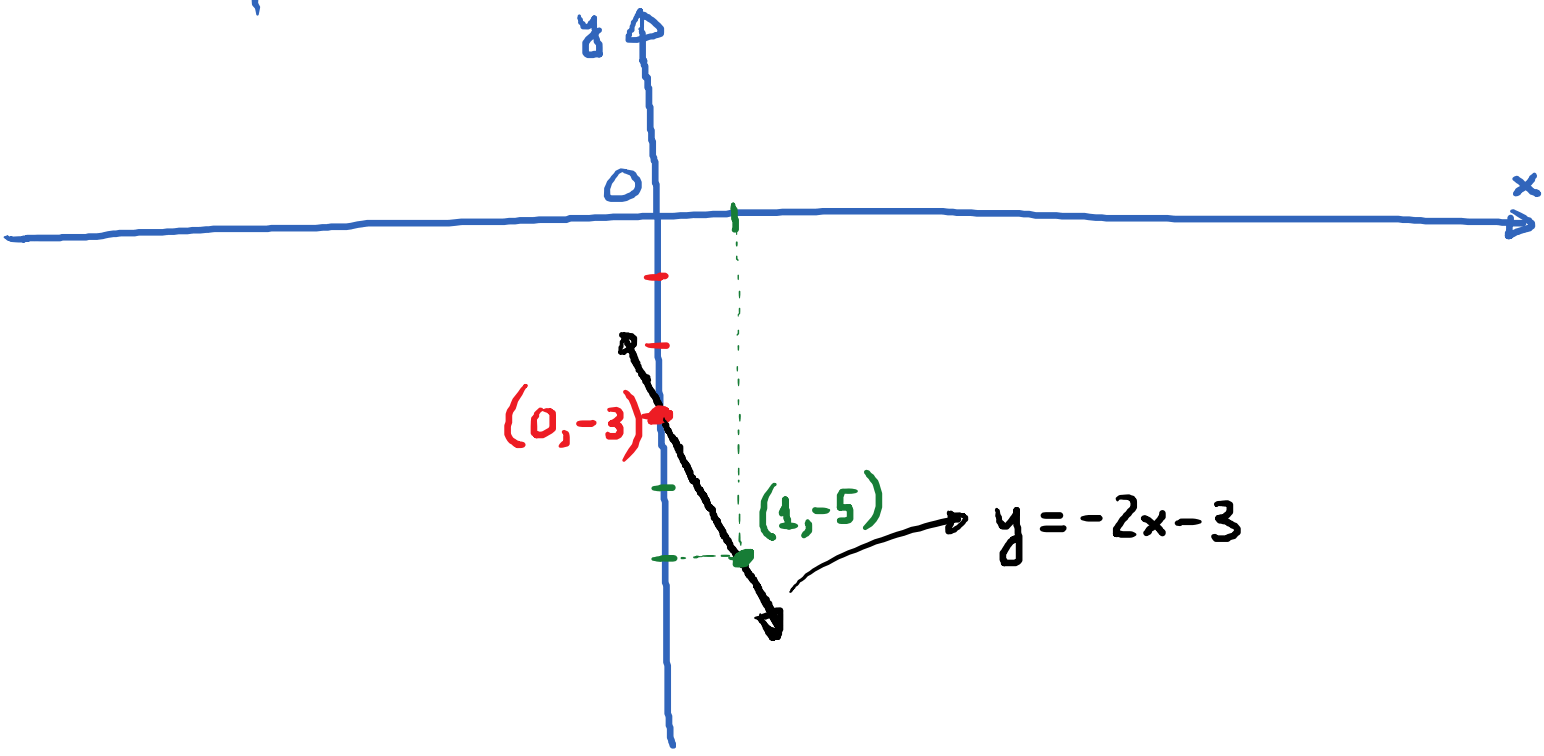
Step 1: Select a value for one variable and calculate the corresponding value of the other variable. Form an ordered pair that belongs to the line.

Step 2: Repeat Step 1 to obtain the second ordered pair.

Step 2: Plot the ordered pairs and draw a straight line through them.

E.g. $y = -2x - 3$. Graph this.

x	$y = -2x - 3$	(x, y)
0	-3	$(0, -3)$
1	-5	$(1, -5)$

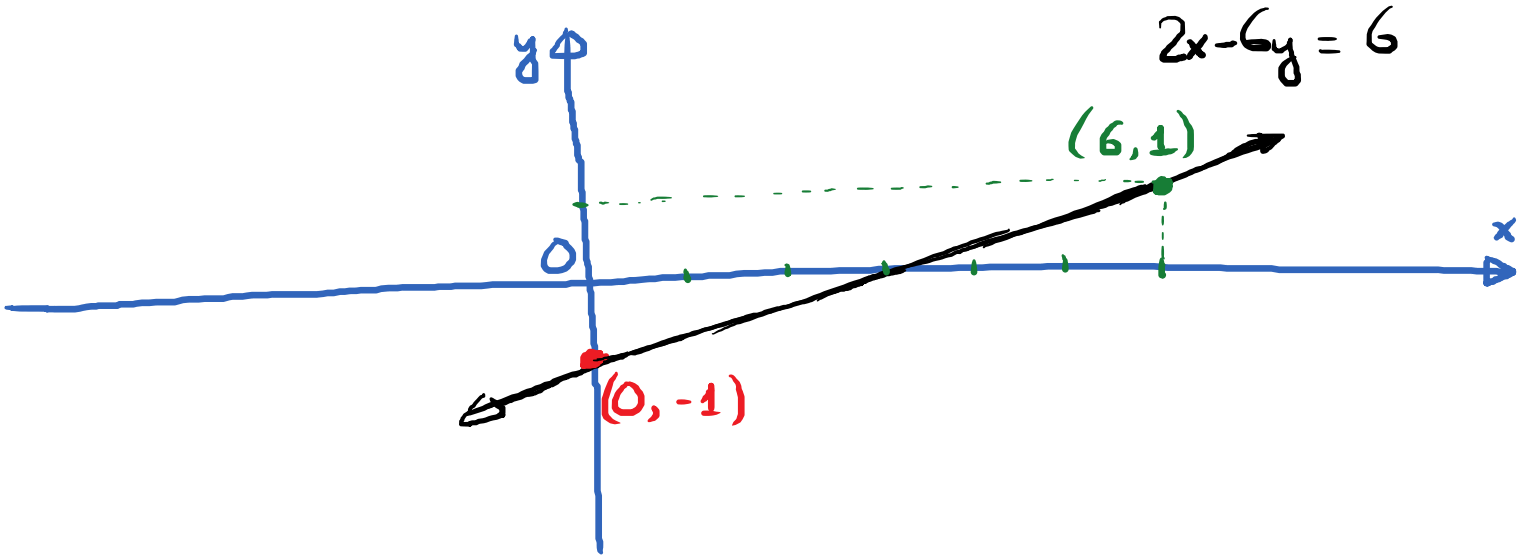


E.g. Graph $2x - 6y = 6$

Isolate y: $\frac{-6y}{-6} = \frac{-2x + 6}{-6}$

$y = \frac{1}{3}x - 1$

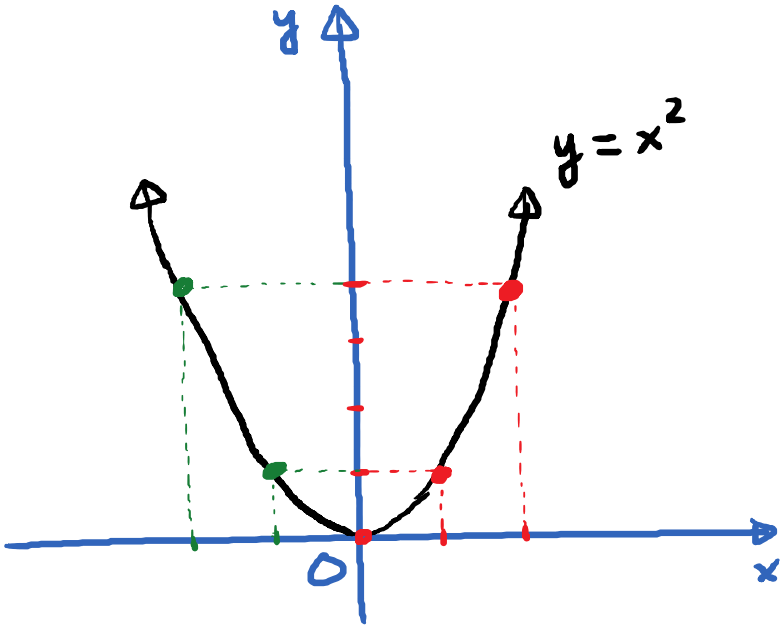
x	$y = \frac{1}{3}x - 1$	(x, y)
0	-1	$(0, -1)$
6	1	$(6, 1)$



(4) Basic Nonlinear Equations

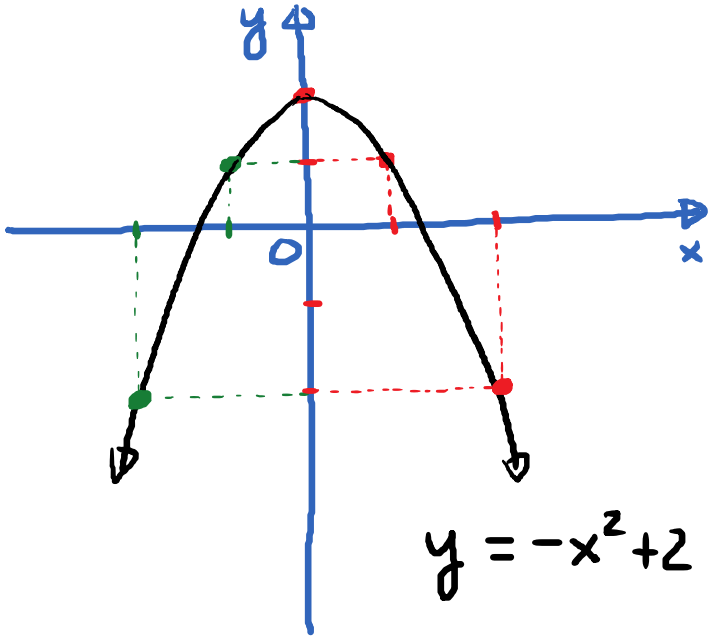
Eg. $y = x^2$.

x	$y = x^2$	(x, y)
-2	4	$(-2, 4)$
-1	1	$(-1, 1)$
0	0	$(0, 0)$
1	1	$(1, 1)$
2	4	$(2, 4)$



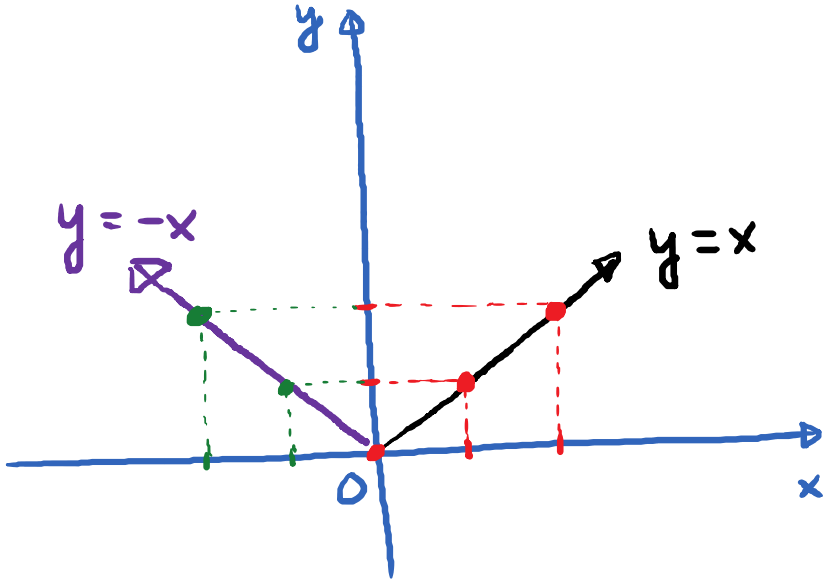
E.g. $y = -x^2 + 2$

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



E.g. Graph $y = |x|$

x	$y = \|x\|$	(x, y)
-2	2	$(-2, 2)$
-1	1	$(-1, 1)$
0	0	$(0, 0)$
1	1	$(1, 1)$
2	2	$(2, 2)$



E.g. Graph $y = -2|x|$

x	$y = -2\|x\|$	(x, y)
-2	-4	$(-2, -4)$
-1	-2	$(-1, -2)$
0	0	$(0, 0)$
1	-2	$(1, -2)$
2	-4	$(2, -4)$