

# P.1 – Sketch the graph of an equation

Consider the equation  $3x + y = 7$ . The point  $(2, 1)$  is a solution point of the equation because the equation is satisfied (true) when 2 is substituted for  $x$  and 1 is substituted for  $y$ . We can easily find other solution points, not by guessing but by sketching the graph of the equation.

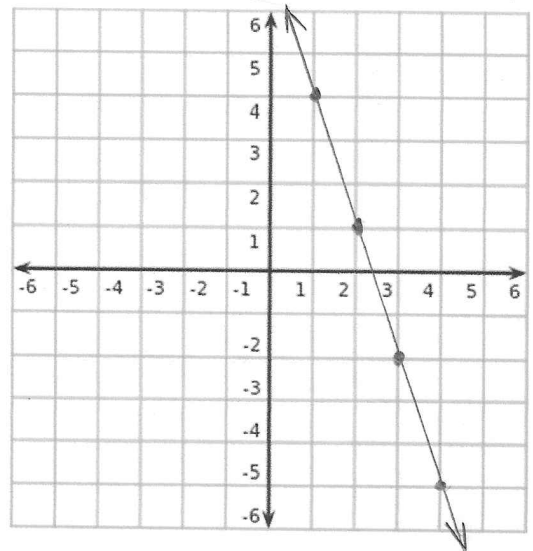
Begin by solving the equation for  $y$ , and substituting multiple values for  $x$ .

$$3x + y = 7 \Rightarrow y = -3x + 7$$

$$\begin{array}{l} x=0 \\ y=7 \end{array} \quad \begin{array}{l} x=1 \\ -3(1)+7=4 \end{array} \quad \begin{array}{l} x=2 \\ -3(2)+7=1 \end{array}$$

$$\begin{array}{l} x=3 \\ -3(3)+7=-2 \end{array} \quad \begin{array}{l} x=4 \\ -3(4)+7=-5 \end{array}$$

$x$	0	1	2	3	4
$y$	7	4	1	-2	-5

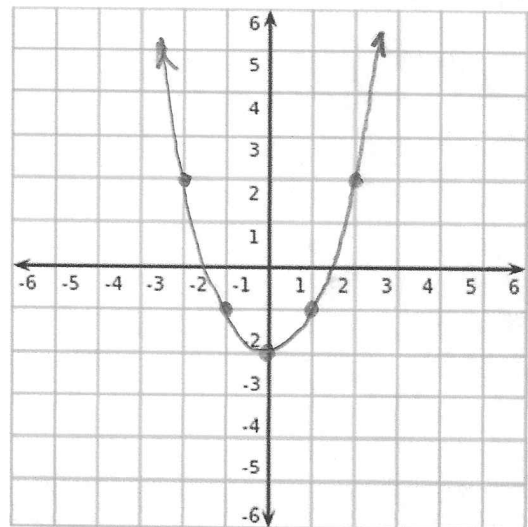


Example 1 Sketch the graph of  $y = x^2 - 2$

$$\begin{array}{l} x=-2 \\ y=(-2)^2-2 \\ y=2 \end{array} \quad \begin{array}{l} x=-1 \\ y=(-1)^2-2 \\ y=-1 \end{array} \quad \begin{array}{l} x=0 \\ y=-2 \end{array}$$

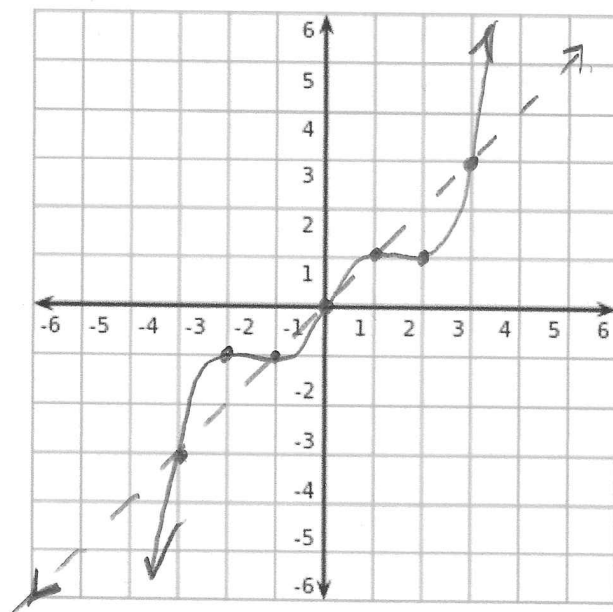
$$\begin{array}{l} x=1 \\ y=1^2-2 \\ y=-1 \end{array} \quad \begin{array}{l} x=2 \\ y=2^2-2 \\ y=2 \end{array}$$

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



Now let us look at the function  $\frac{1}{30}x(39 - 10x^2 + x^4)$

x	-3	(-2)	-1	0	1	(2)	3
y	-3	(-1)	-1	0	1	(1)	3



$$x = -3$$

$$y = \frac{1}{30}(-3)(39 - 10(-3)^2 + (-3)^4)$$

$$y = -\frac{1}{10}(39 - 90 + 81)$$

$$y = -\frac{1}{10}(30)$$

$$y = -3$$

use a calculator

$$x = -1 \quad x = 0 \quad x = 1 \quad x = 3$$

$$y = -1 \quad y = 0 \quad y = 1 \quad y = 3$$

notice it appears linear (dash)  
so, lets let  $x = -2 \neq 2$

$$x = -2 \quad x = 2$$

$$y = -1 \quad y = 1$$

our graph will actually look more like this (solid)

BE MINDFUL TO PLOT ENOUGH POINTS

HW: 6-14 evens

In Exercises 5-14, sketch the graph of the equation by point plotting.

5.  $y = \frac{3}{2}x + 1$

6.  $y = 6 - 2x$

7.  $y = 4 - x^2$

8.  $y = (x - 3)^2$

9.  $y = |x + 2|$

10.  $y = |x| - 1$

11.  $y = \sqrt{x} - 4$

12.  $y = \sqrt{x + 2}$

13.  $y = \frac{2}{x}$

14.  $y = \frac{1}{x - 1}$