7.2. Graphs Transformations

Thursday, September 27, 2018 11:56 AM

Objectives : (1) Vertical Translation and Horizontal Translation

(2) Reflections

(3) Vertical Stretching and Shrinking

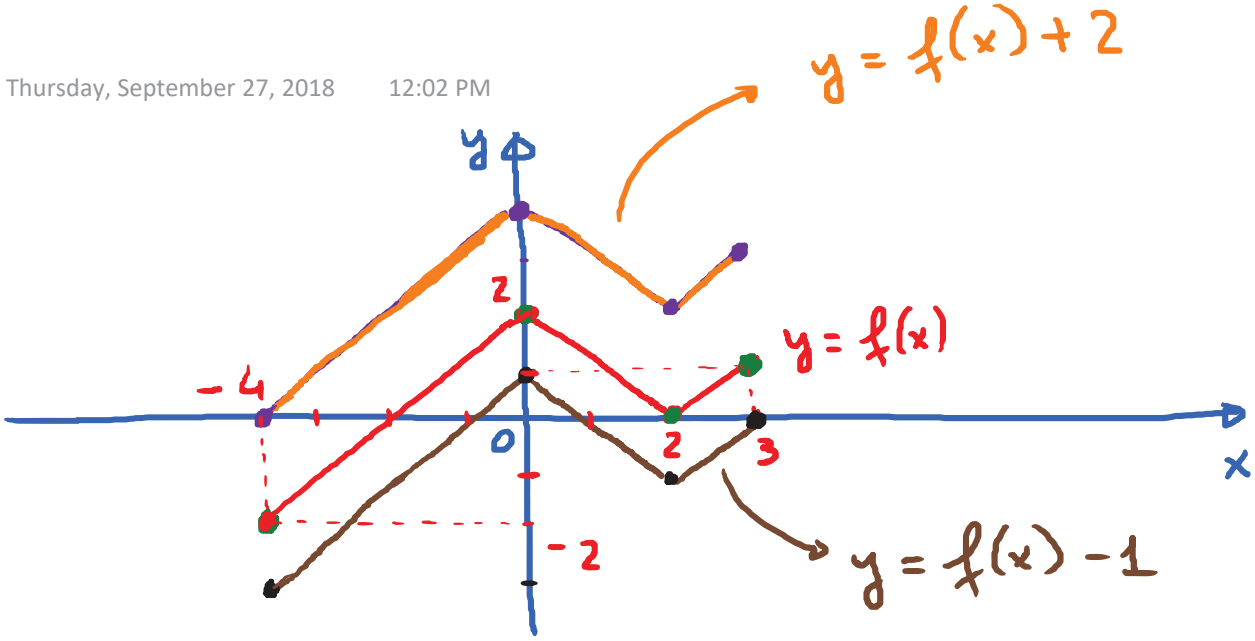
Horizontal Stretching and Shrinking

(1) Vertical Translation.

For $b > 0$:

The graph of $y = f(x) + b$ is the graph of $y = f(x)$ shifted up b units

The graph of $y = f(x) - b$ is the graph of $y = f(x)$ shifted down b units



Use this graph to obtain the graph of $y = f(x) + 2$ and $y = f(x) - 1$.

Key points of $y = f(x)$

x	$y = f(x)$	(x, y)
-4	-2	(-4, -2)
0	2	(0, 2)
2	0	(2, 0)
3	1	(3, 1)

Key points for $y = f(x) + 2$

(-4, 0)
(0, 4)
(2, 2)
(3, 3)

Key points for $y = f(x) - 1$

(-4, -3)
(0, 1)
(2, -1)
(3, 0)

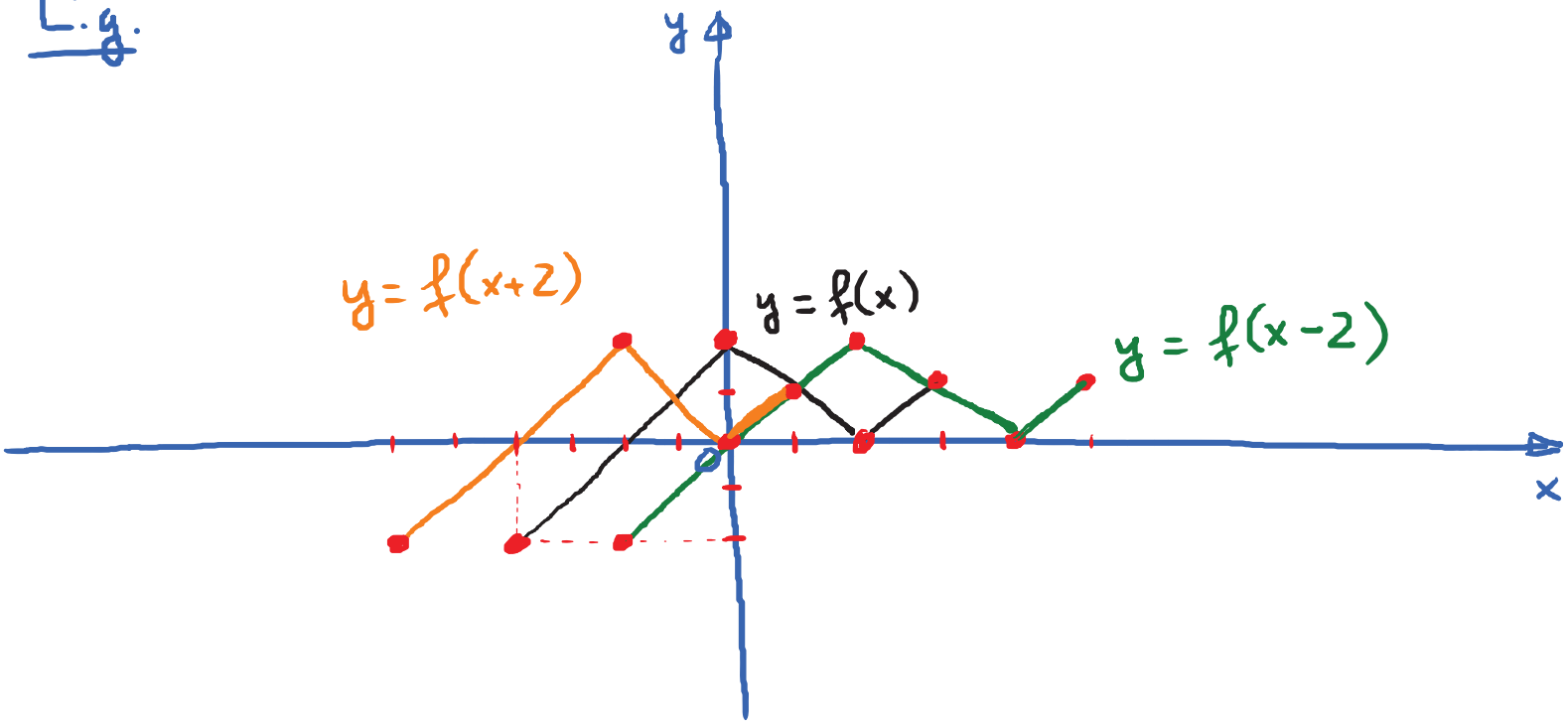
Horizontal Translation

For $d > 0$:

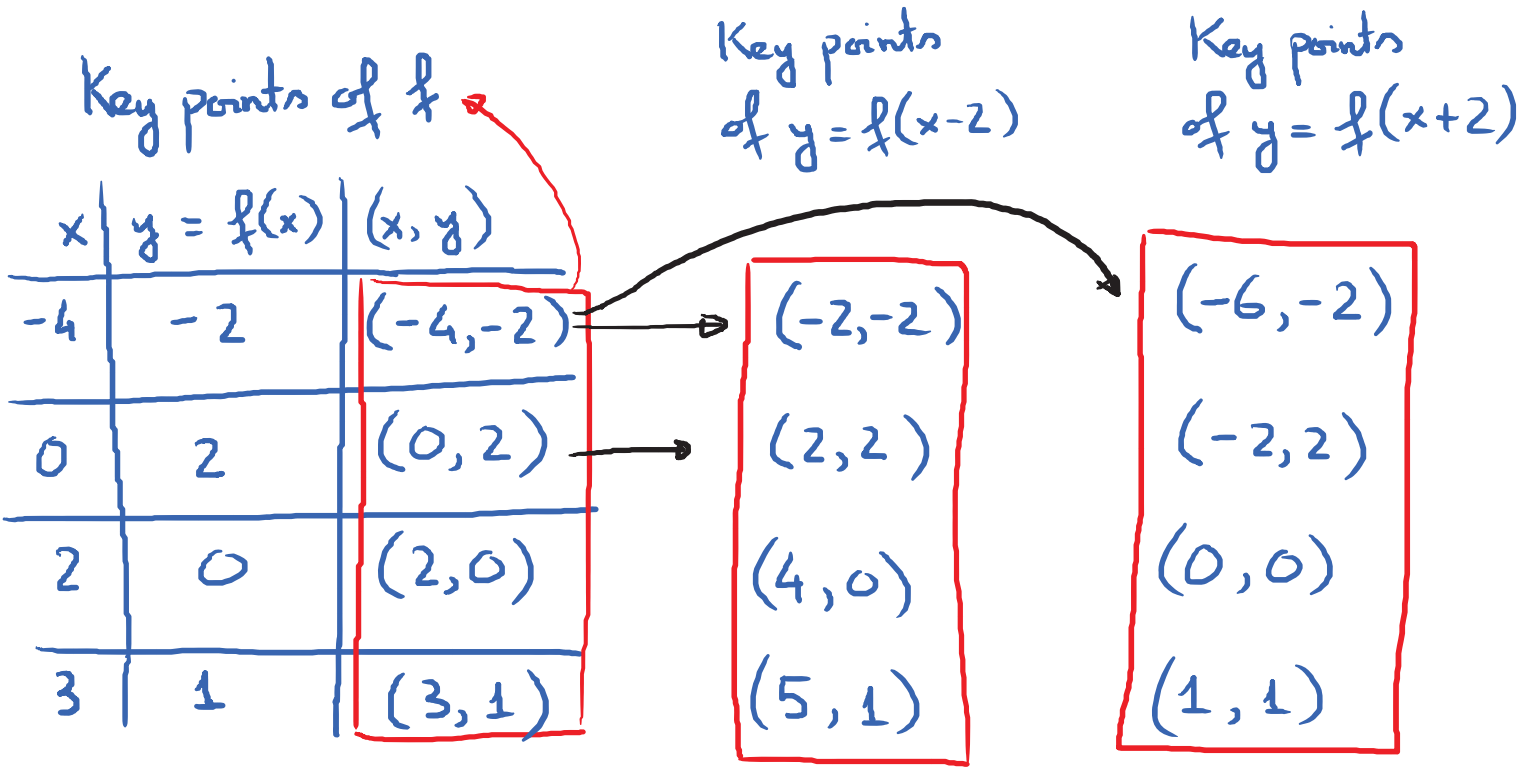
The graph of $y = f(x-d)$ is the graph of $y = f(x)$ shifted to the right d units

The graph of $y = f(x+d)$ is the graph of $y = f(x)$ shifted to the left d units

E.g.



Use this graph to obtain the graph of $y = f(x-2)$ and $y = f(x+2)$

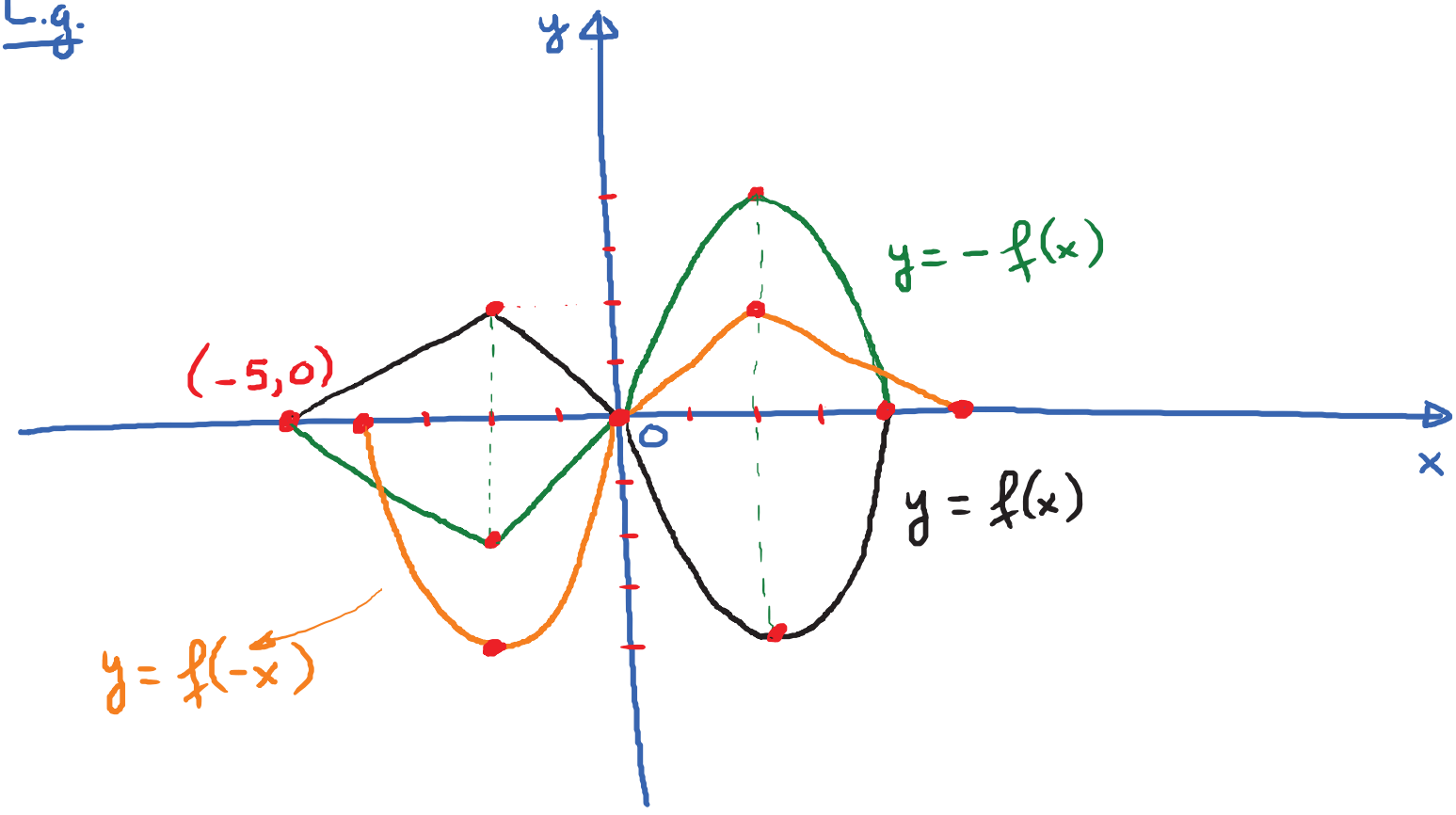


(2) Reflections

The graph $y = -f(x)$ is the reflection of the graph of $y = f(x)$ **across the x-axis**

The graph $y = f(-x)$ is the reflection of the graph of $y = f(x)$ **across the y-axis**

E.g.



Use this to obtain the graph of $y = -f(x)$ and

$y = f(-x)$