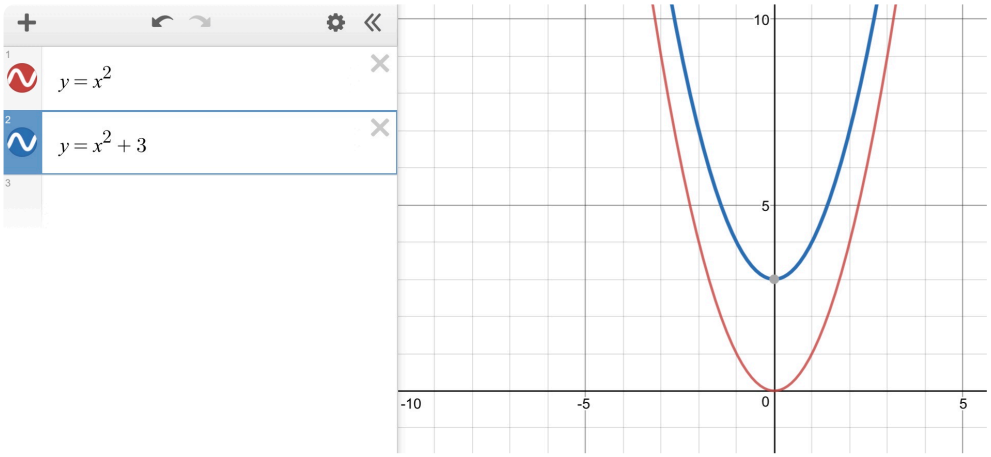
Translations and a Reflections of Graphs of Functions

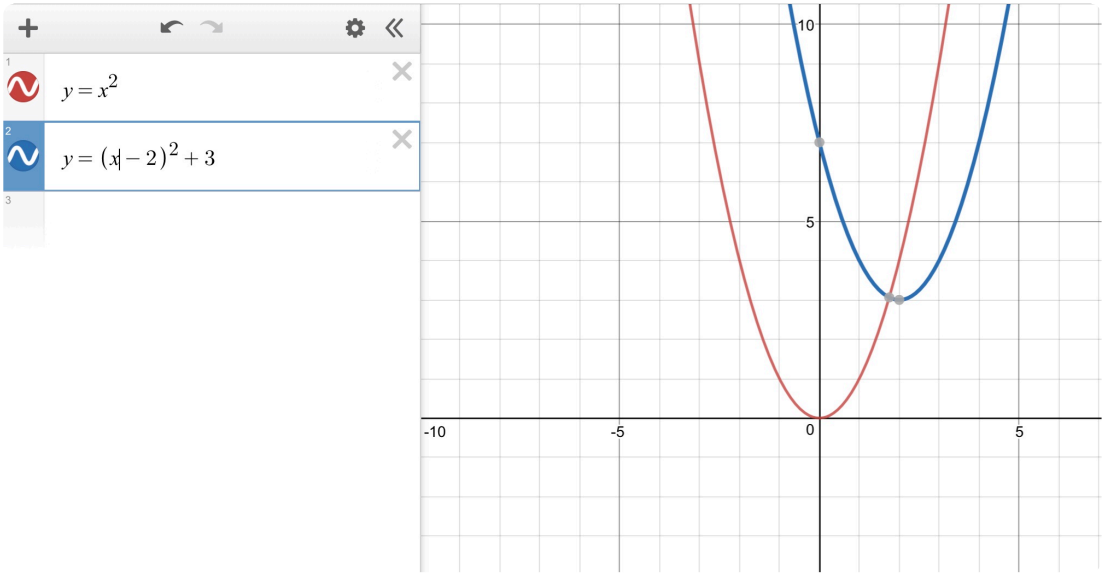
$y = f(x)$ $\quad$ $y = f(x-2)$ $\quad$ Translation by $\begin{pmatrix} 2 \\ 0 \end{pmatrix}$

$y = f(x)$ $\quad$ $y = f(x-a)$ $\quad$ Translation by $\begin{pmatrix} a \\ 0 \end{pmatrix}$



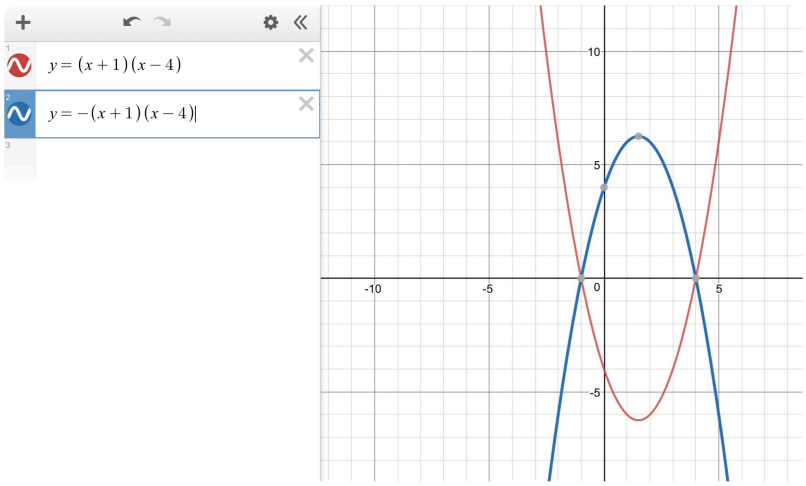
$y = f(x)$ $\quad$ $y = f(x) + 3$ $\quad$ Translation by $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$

$y = f(x)$ $\quad$ $y = f(x) + b$ $\quad$ Translation by $\begin{pmatrix} 0 \\ b \end{pmatrix}$



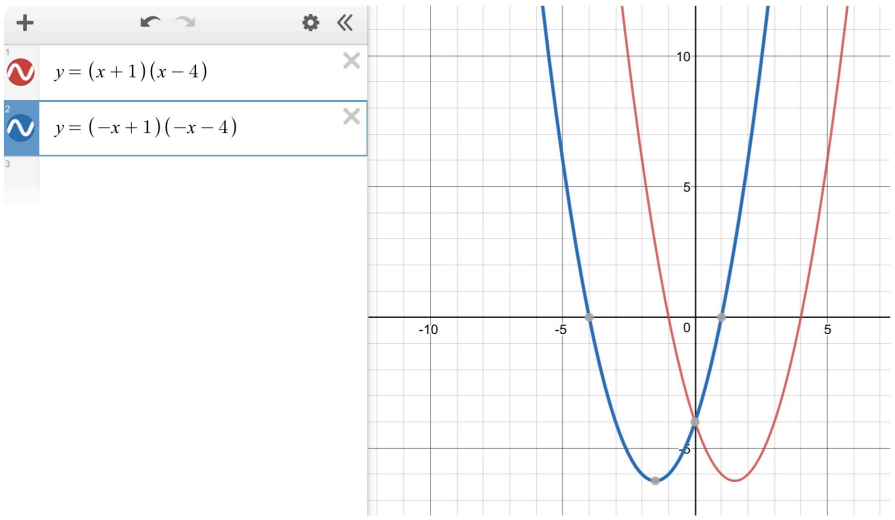
$y = f(x)$ $\quad$ $y = f(x-2) + 3$ $\quad$ Translation by $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

$y = f(x)$ $\quad$ $y = f(x-a) + b$ $\quad$ Translation by $\begin{pmatrix} a \\ b \end{pmatrix}$



$y = f(x)$ $\qquad$ $y = -f(x)$

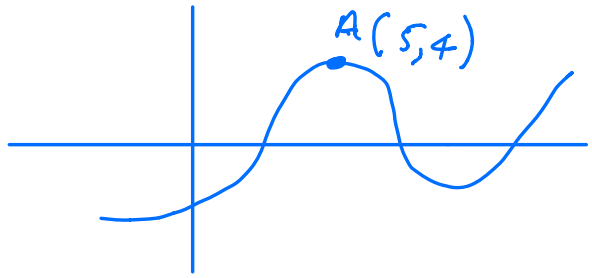
A reflection in the x-axis



$y = f(x)$ $\qquad$ $y = f(-x)$

A reflection in the y-axis

Exercise



$y = f(x)$

Where does the point A move to?

1) $y = f(x+1)$ $A_1(4,4)$

2) $y = f(x) - 3$ $A_1(5,1)$

3) $y = f(x-2) + 1$ $A_1(7,5)$

4) $y = -f(x)$ $A_1(5,-4)$

5) $y = f(-x)$ $A_1(-5,4)$

6) $y = -f(x+2)$ $A_1(3,-4)$

7) $y = f(-x) - 1$ $A_1(-5,3)$