Reflecting Graphs in Axes

Starter

1. **(Review of last lesson)** Consider the function $y = \frac{1}{x}$.

(a) Describe the translation(s) that takes $y = \frac{1}{x}$ to the function $y = \frac{1}{x-2} - 5$:

(b) Give the equation of the curve after $y = \frac{1}{x}$ has undergone a translation give by $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$

Working: (a) **"-2" is "to the x" so horizontal and since it is negative it moves to the right**
"-5" is "to the function" so vertical and since it is negative it moves down
Horizontal translation, 2 units to the right;
vertical translation, 5 units down

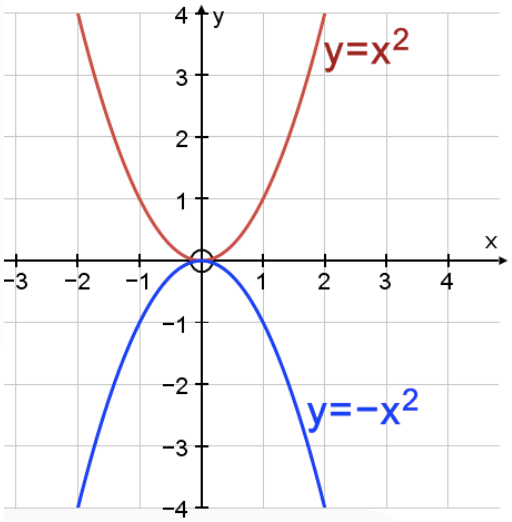
(b) $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$ ***means 4 units left and 1 unit up***
4 units left $\Rightarrow$ **"$+4$" is "to the x"**
1 unit up $\Rightarrow$ **"$+1$" is "to the function"**
$y = \frac{1}{x+4} + 1$

E.g. 1 For the function $y = x^2$ describe the transformation given by:
(a) $y = -x^2$ (b) $y = (-x)^2$
Sketch the graph to illustrate the result.

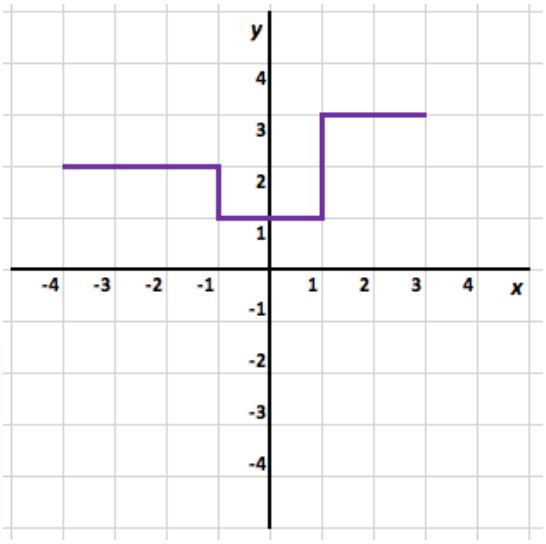
Working: (a) Reflection in the $x-$axis

(b) $y = (-x)^2 = x^2$ so the curve is the same as the original.

Reflection in the $y-$axis.

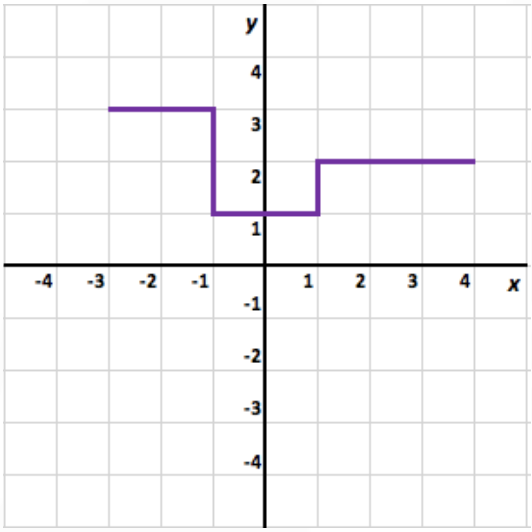


E.g. 2 The graph shown is the graph of $y = f(x)$.
On separate axes sketch the graphs of:
(a) $y = f(-x)$
(b) $y = -f(x)$

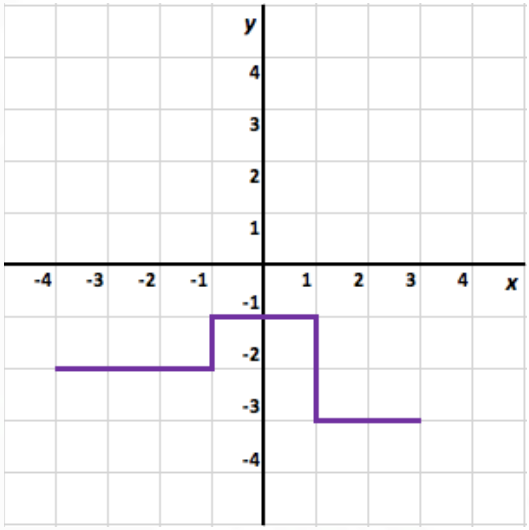


Working:

(a) Reflection in the $y-$axis.



(b) Reflection in the $x-$axis.



Video: Transformation of graphs A
Video: Transformation of graphs B

Solutions to Starter and E.g.s

Exercise

9-1 class textbook:	p553 E17.3 Qu 1c, 2d, 3bd, 7, 9b, 10c
A*-G class textbook:	p511 E17.3 Qu 1c, 2d, 3bd, 7, 9b, 10c
9-1 homework book:	p186 E17.3 Qu 1b, 2ce/g, 3bd, 5, 6c
A*-G homework book:	p141 E17.3 Qu 1b, 2ce, 3bd, 5

Homework book answers (only available during a lockdown)