

Translating quadratic graphs

A LEVEL LINKS

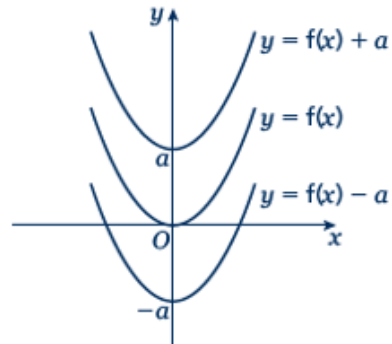
Scheme of work: 1f. Transformations – transforming graphs – $f(x)$ notation

Key points

- The transformation $y = f(x) \pm a$ is a translation of $y = f(x)$ parallel to the y -axis; it is a vertical translation.

As shown on the graph,

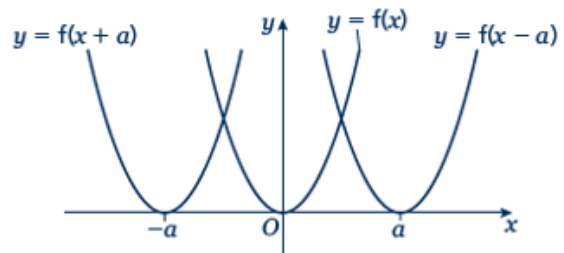
- $y = f(x) + a$ translates $y = f(x)$ up
- $y = f(x) - a$ translates $y = f(x)$ down.



- The transformation $y = f(x \pm a)$ is a translation of $y = f(x)$ parallel to the x -axis; it is a horizontal translation.

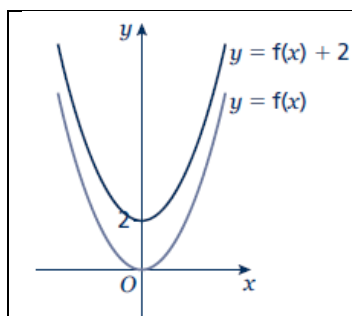
As shown on the graph,

- $y = f(x + a)$ translates $y = f(x)$ to the left
- $y = f(x - a)$ translates $y = f(x)$ to the right.



Example 1 The graph shows the function $y = f(x)$.

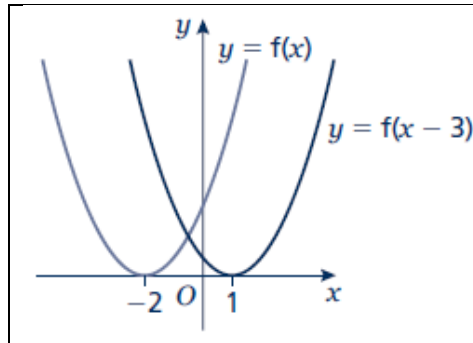
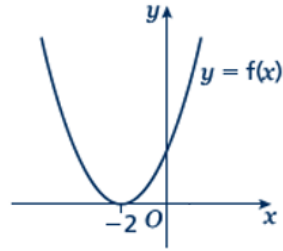
Sketch the graph of $y = f(x) + 2$.



For the function $y = f(x) + 2$ translate the function $y = f(x)$ 2 units up.

Example 2 The graph shows the function $y = f(x)$.

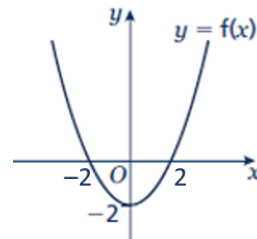
Sketch the graph of $y = f(x - 3)$.



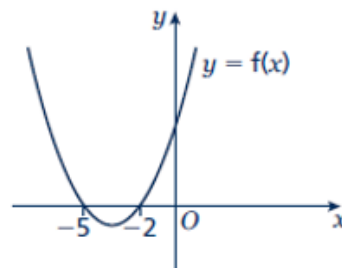
For the function $y = f(x - 3)$ translate the function $y = f(x)$ 3 units right.

Practice questions

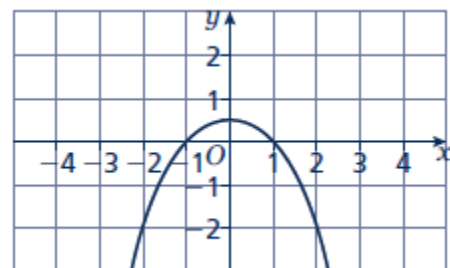
- 1 The graph shows the function $y = f(x)$.
Copy the graph and on the same axes sketch and label the graphs of $y = f(x) + 4$ and $y = f(x + 2)$.



- 2 The graph shows the function $y = f(x)$.
Copy the graph and on the same axes sketch the graph of $y = f(x - 5)$.

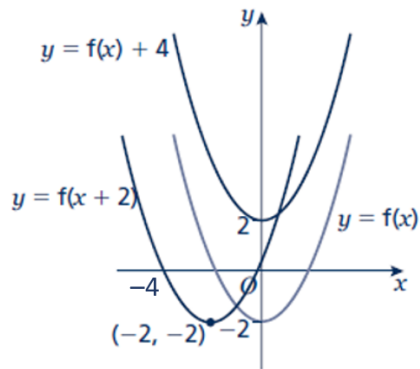


- 3 The graph shows the function $y = f(x)$.
- Sketch the graph of $y = f(x) + 2$
 - Sketch the graph of $y = f(x + 2)$

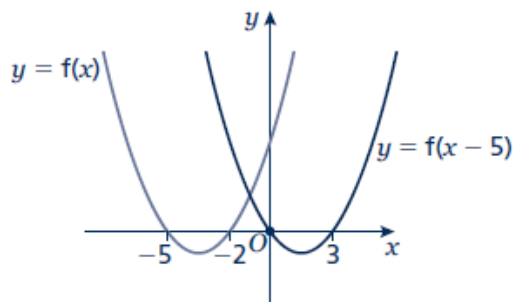


Answers

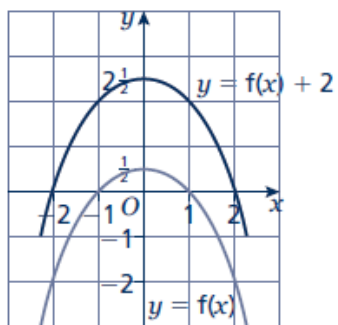
1



2



3 a



b

