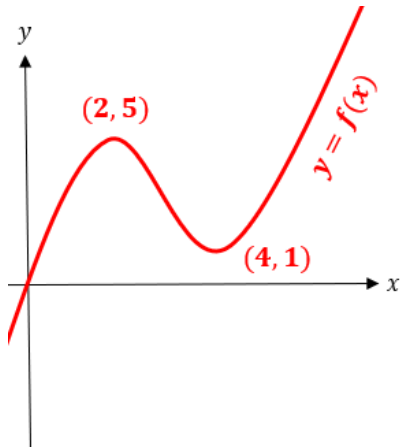# 4.7) Transforming functions

Worked example

A sketch of the curve $y = f(x)$ is shown.
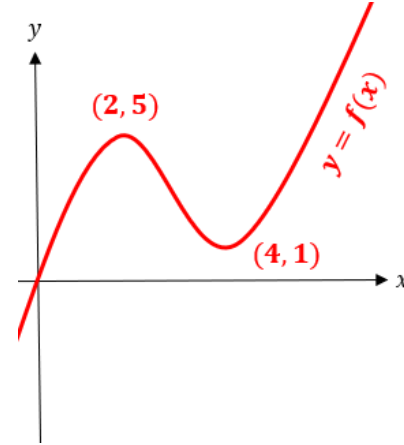

Sketch:

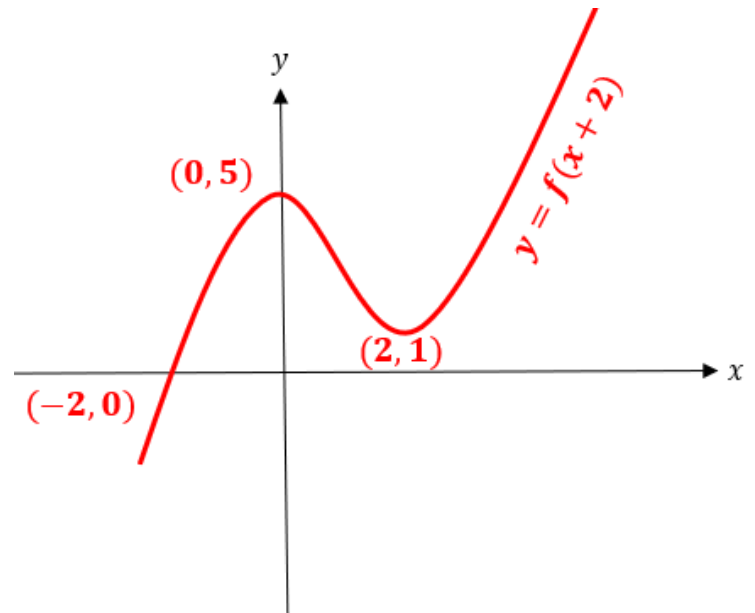$$y = f(x - 3)$$

Your turn

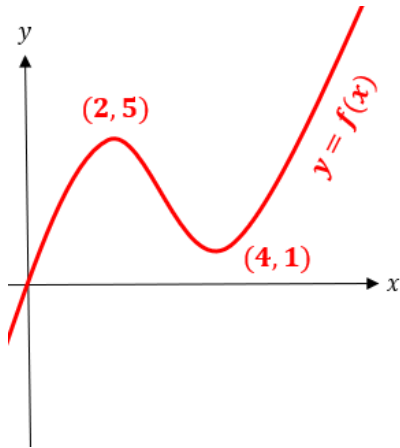A sketch of the curve $y = f(x)$ is shown.
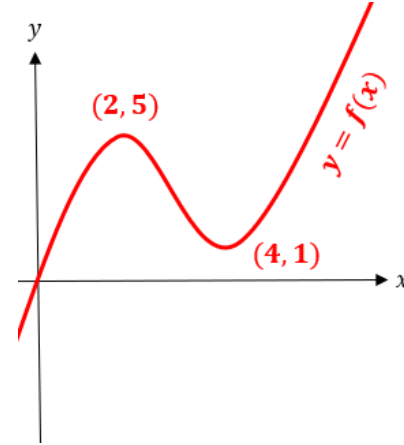
Sketch:

$$y = f(x + 2)$$

Worked example	Your turn
A sketch of the curve $y = f(x)$ is shown.	A sketch of the curve $y = f(x)$ is shown.

Sketch:

$$y = f(x) - 3$$

Sketch:

$$y = f(x) + 2$$

Worked example	Your turn
A sketch of the curve $y = f(x)$ is shown.	A sketch of the curve $y = f(x)$ is shown.

Sketch:

$$y = f(4x)$$
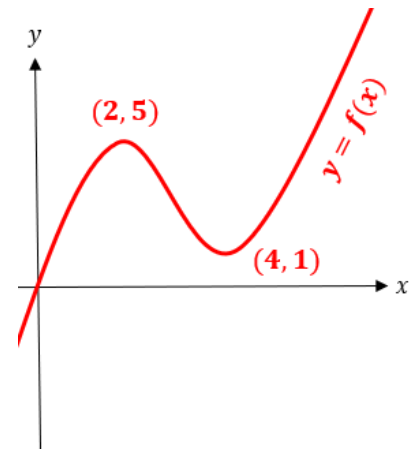
Sketch:

$$y = f(2x)$$

Worked example	Your turn
A sketch of the curve $y = f(x)$ is shown.	A sketch of the curve $y = f(x)$ is shown.

Worked example graph showing curve $y = f(x)$ with points $(2, 5)$ and $(4, 1)$

Your turn graph showing curve $y = f(x)$ with points $(2, 5)$ and $(4, 1)$

Sketch:

$$y = f\left(\frac{x}{4}\right)$$

Sketch:

$$y = f\left(\frac{x}{3}\right)$$

Answer graph showing curve $y = f\left(\frac{x}{3}\right)$ with points $(6, 5)$ and $(12, 1)$
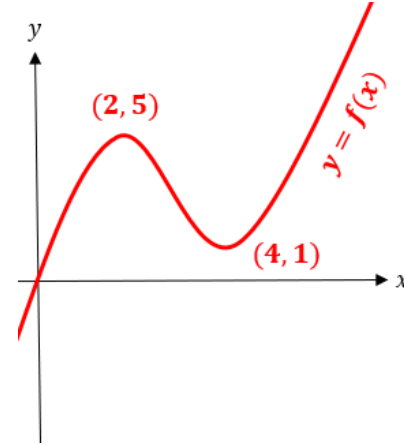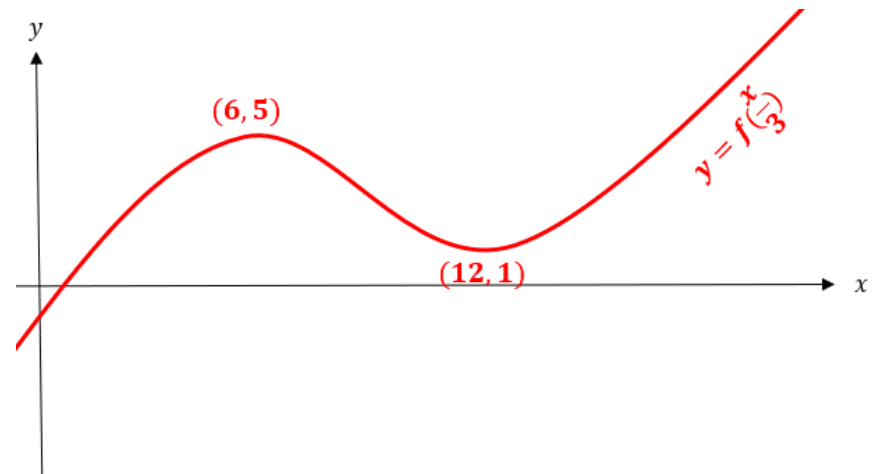
Worked example

A sketch of the curve $y = f(x)$ is shown.
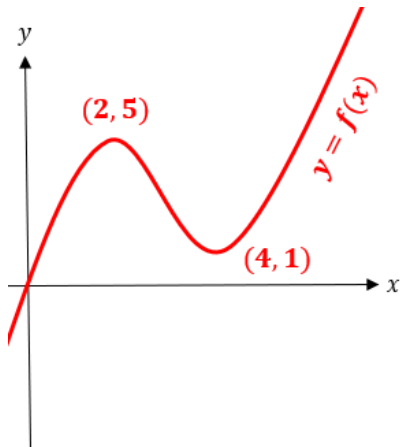
Sketch:

$$y = f(-x)$$

Your turn

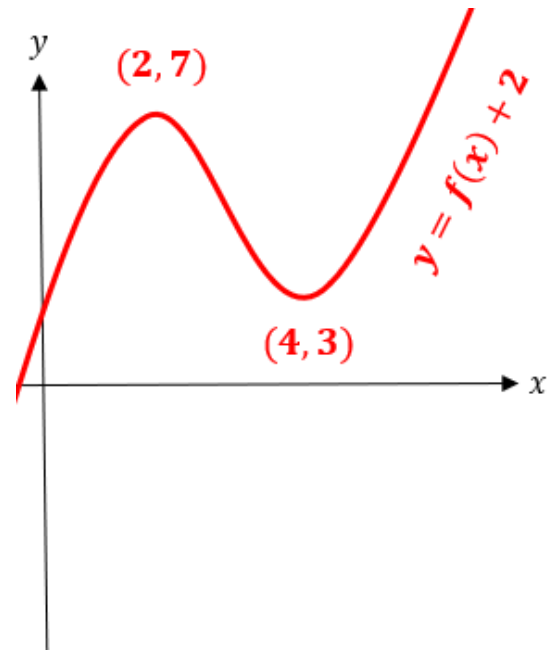A sketch of the curve $y = f(x)$ is shown.
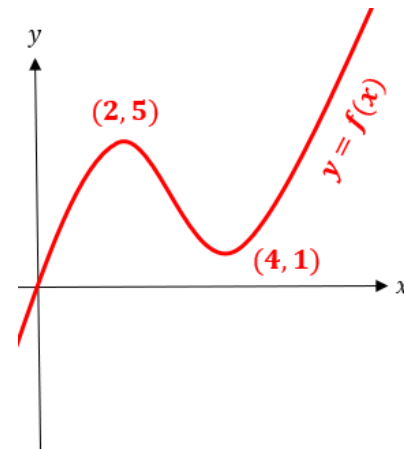
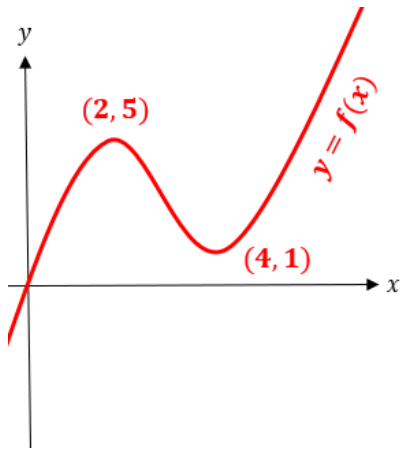Sketch:

$$y = -f(x)$$
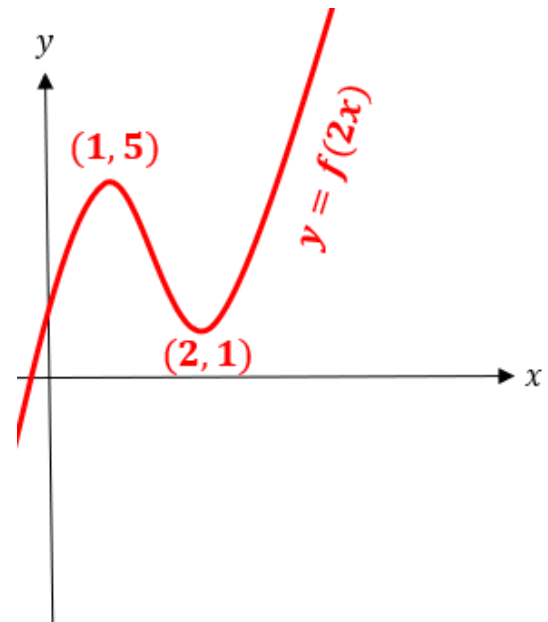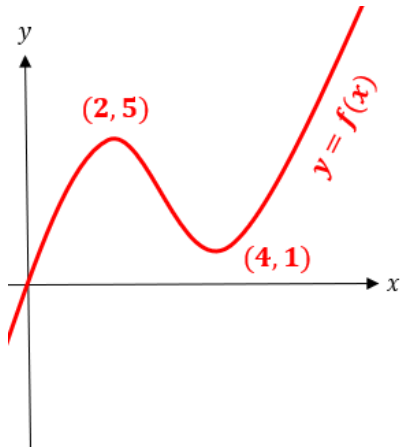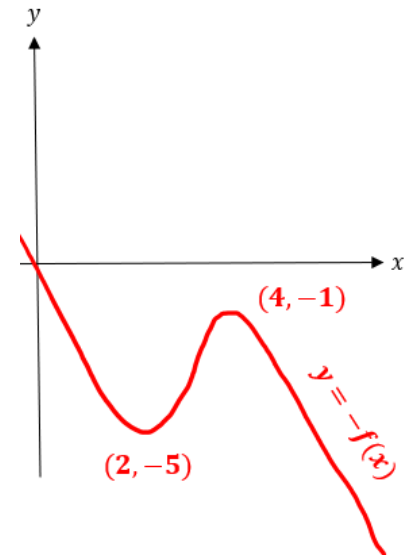
Worked example

Find the new coordinates under the transformations

$y = f(x)$	$(-6, 4)$	$(0, 1)$
$y = f(x + 2)$		
$y = f(x) - 2$		
$y = f(3x)$		
$y = 4f(x)$		
$y = f\left(\dfrac{x}{5}\right)$		
$y = 6f(x)$		
$y = -f(x)$		
$y = f(-x)$		

Your turn

Find the new coordinates under the transformations

$y = f(x)$	$(6, -4)$	$(1, 0)$
$y = f(x + 1)$	$(5, -4)$	$(0, 0)$
$y = f(x) - 1$	$(6, -5)$	$(1, -1)$
$y = f(2x)$	$(3, -4)$	$\left(\dfrac{1}{2}, 0\right)$
$y = 3f(x)$	$(6, -12)$	$(1, 0)$
$y = f\left(\dfrac{x}{4}\right)$	$(24, -4)$	$(4, 0)$
$y = \dfrac{1}{5}f(x)$	$(6, -0.8)$	$(1, 0)$
$y = -f(x)$	$(6, 4)$	$(1, 0)$
$y = f(-x)$	$(-6, -4)$	$(-1, 0)$

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve:	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:
$$y = 2f(x) + 3$$	$$y = 5f(x) - 6$$
	$(3, 14)$
$$y = 3f(x) - 2$$	

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve:	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:
$$y = f(2x) + 3$$	$$y = f(5x) - 6$$ $$(\frac{3}{5}, -2)$$
$$y = f(3x) - 2$$	

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve: $$y = -f(x) + 3$$ $$y = -f(x) - 2$$	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation: $$y = -f(x) - 6$$ $$(3, -10)$$

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve: $$y = f(-x) + 3$$	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation: $$y = -f(-x) - 6$$ $$(-3, -10)$$

$$y = f(-x) - 2$$

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve: $$y = -2f(x) + 3$$	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation: $$y = -5f(x) - 6$$ $$(3, -26)$$
$$y = -3f(x) - 2$$	

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve: $$y = 2f(-x) + 3$$ $$y = 3f(-x) - 2$$	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation: $$y = 5f(-x) - 6$$ $$(-3, 14)$$

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve: $$y = -2f(-x) + 3$$ $$y = -3f(-x) - 2$$	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation: $$y = -5f(-x) - 6$$ $$(-3, -26)$$

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve: $$y = 3f(2x) + 7$$ $$y = 7f(5x) - 2$$	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation: $$y = 5f(3x) - 7$$ $$(1, 13)$$

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve: $$y = -3f(2x) + 7$$	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation: $$y = -5f(3x) - 7$$ $$(1, -27)$$

$$y = -7f(5x) - 2$$

Worked example	Your turn
The point $A(2, 5)$ is the minimum of the curve with equation $y = f(x)$. Write the new coordinates of the new minimum of the curve:	The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:
$$y = -3f(-2x) + 7$$	$$y = -5f(-3x) - 7$$ $$(-1, -27)$$
$$y = -7f(-5x) - 2$$	