

## GRAPH TRANSFORMATIONS - PRACTICE QUESTIONS

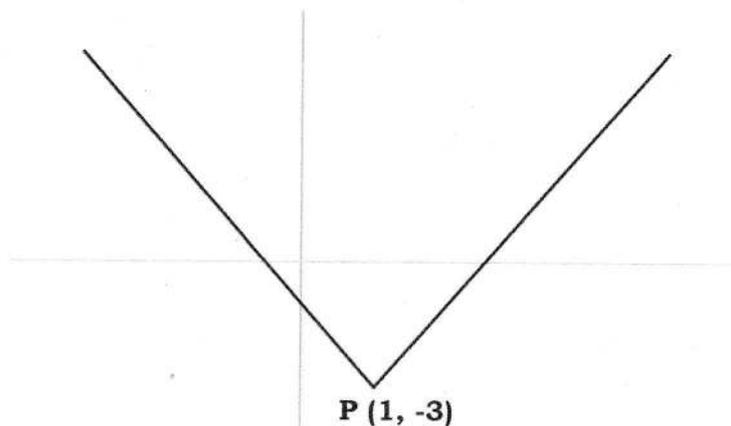


metatutor

1.

Pictured below is the graph  $y = f(x)$ .

The point P is a point on the graph, with co-ordinates (1, -3).



What are the co-ordinates of point P when  $y = f(x)$  is transformed to:

(a)  $y = f(x) + 5$

(1, 2)

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

(1, 3)

(c)  $y = f(x + 3)$

(-2, -3)

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

(-1, -3)

2.

Pictured below is the graph  $y = g(x)$ .

The point Q is a point on the graph, with co-ordinates (4, 4).

What are the co-ordinates of point Q when  $g(x)$  is transformed to:

(a)  $y = -g(x)$

(4, -4)

(b)  $y = g(x - 2)$

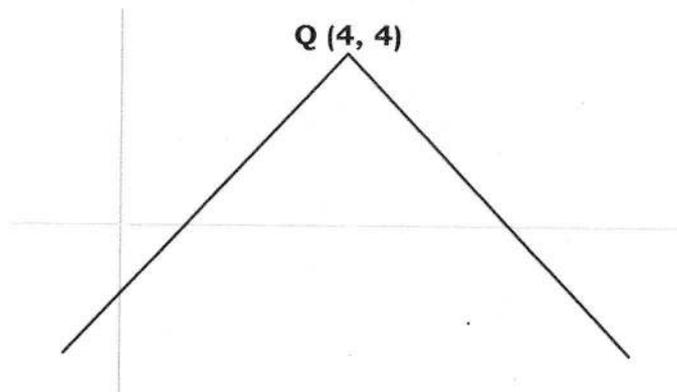
(6, 4)

(c)  $y = g(x) - 8$

(4, -4)

(d)  $y = g(-x)$

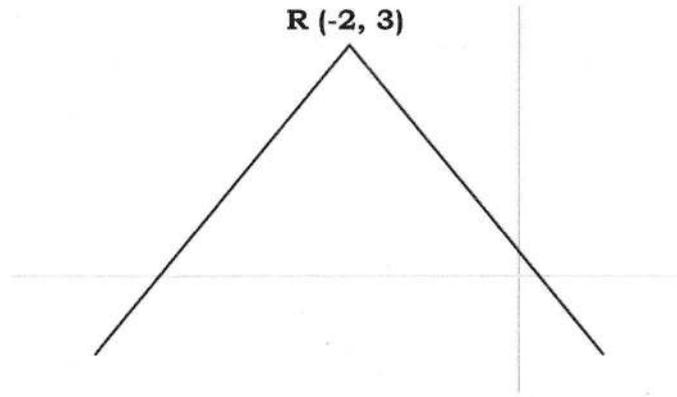
(-4, 4)



3.

Pictured below is the graph  $y = h(x)$ .

The point R is a point on the graph, with co-ordinates  $(-2, 3)$ .



What are the co-ordinates of point R when  $h(x)$  is transformed to:

(a)  $y = h(x) + 7$

$(-2, 10)$

(b)  $y = h(-x)$

$(2, 3)$

(c)  $y = -h(x)$

$(-2, -3)$

(d)  $y = h(x - 2)$

$(0, 3)$

4.

Pictured below is the graph  $y = i(x)$ .

The point S is a point on the graph, with co-ordinates  $(-4, -1)$ .

What are the co-ordinates of point S when  $i(x)$  is transformed to:

(a)  $y = i(x + 2)$

$(-6, -1)$

(b)  $y = i(-x)$

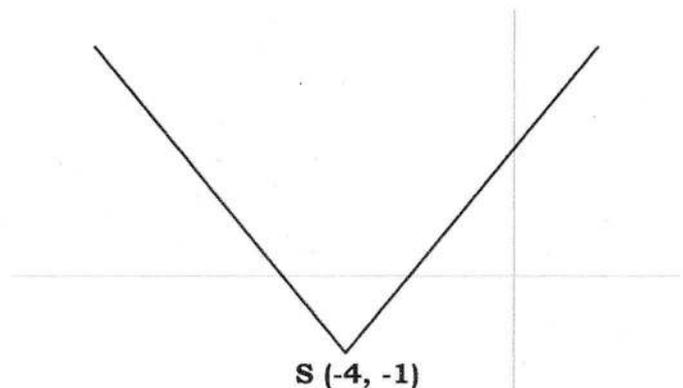
$(4, -1)$

(c)  $y = i(x) + 10$

$(-4, 9)$

(d)  $y = -i(x)$

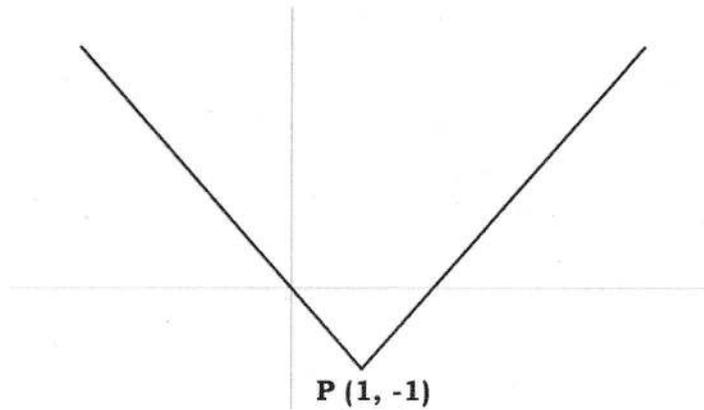
$(-4, 1)$



5.

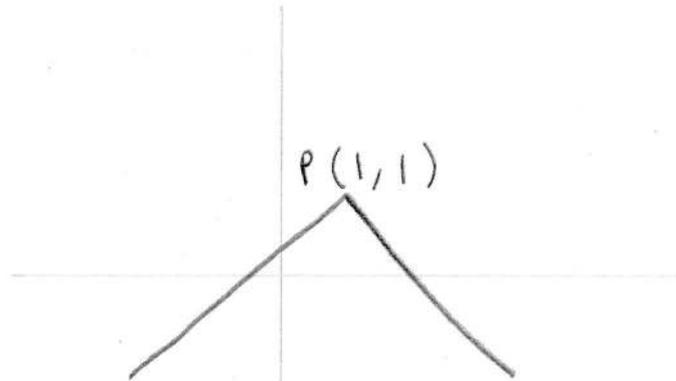
Pictured below is the graph  $y = f(x)$ .

The point P is a point on the graph, with co-ordinates (1, -1).

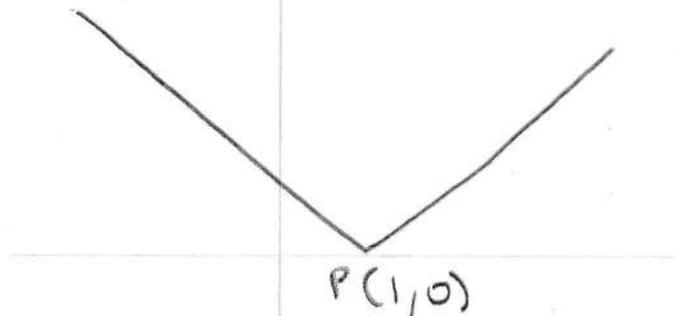


Sketch the following graphs on the axes below, clearly labelling point P:

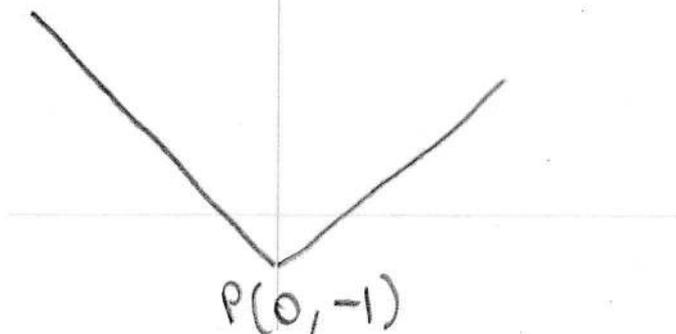
(a)  $y = -f(x)$



(b)  $y = f(x) + 1$



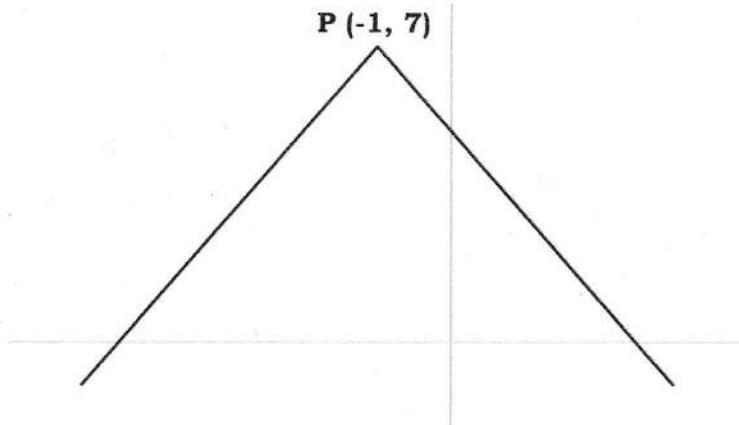
(c)  $y = f(x + 1)$



6.

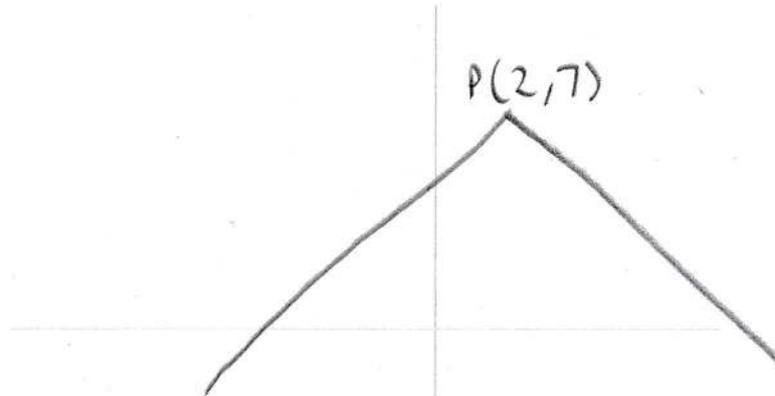
Pictured below is the graph  $y = f(x)$ .

The point P is a point on the graph, with co-ordinates  $(-1, 7)$ .

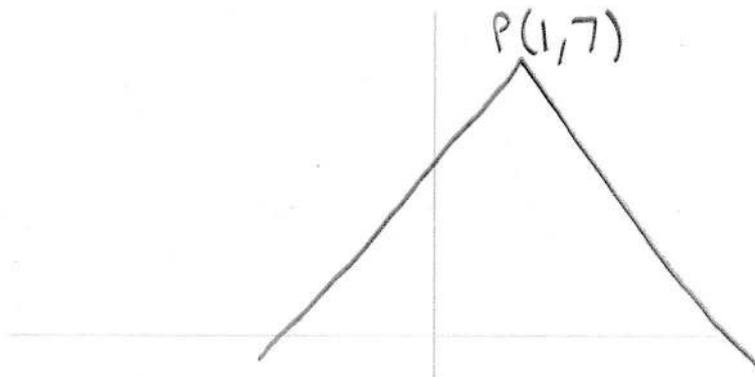


Sketch the following graphs on the axes below, clearly labelling point P:

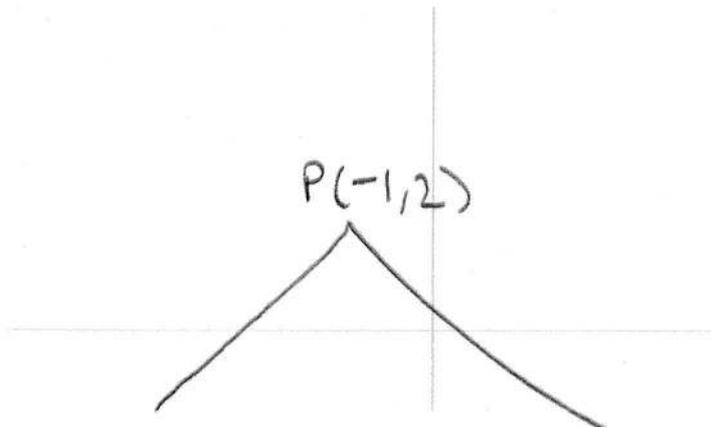
(a)  $y = f(x - 3)$



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



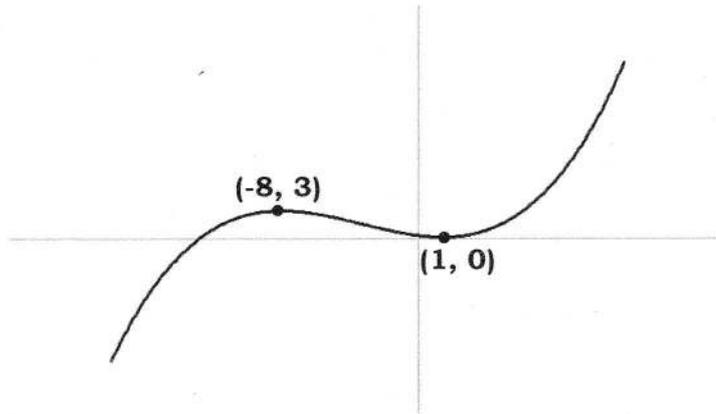
(c)  $y = f(x) - 5$



7.

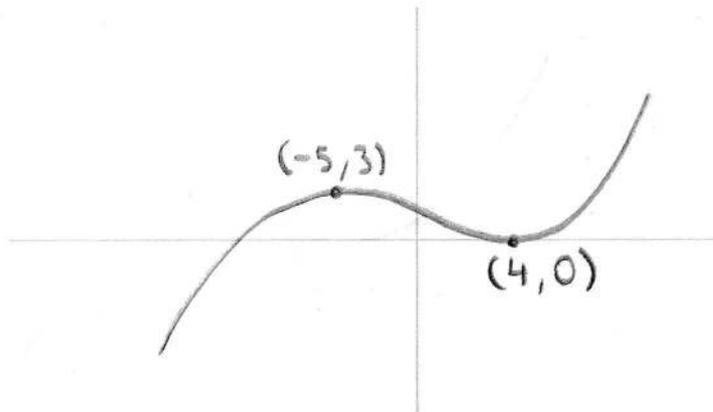
Pictured below is the curve  $y = f(x)$ .

The curve has stationary points at  $(-8, 3)$  and  $(1, 0)$ .

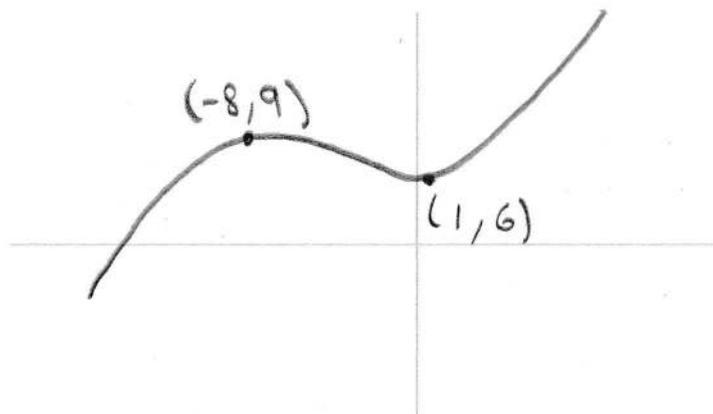


Sketch the following curves on the axes below, clearly labelling their stationary points:

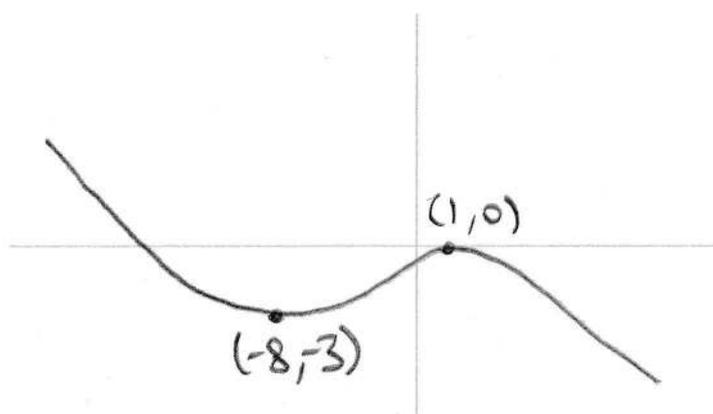
(a)  $y = f(x - 3)$



(b)  $y = f(x) + 6$



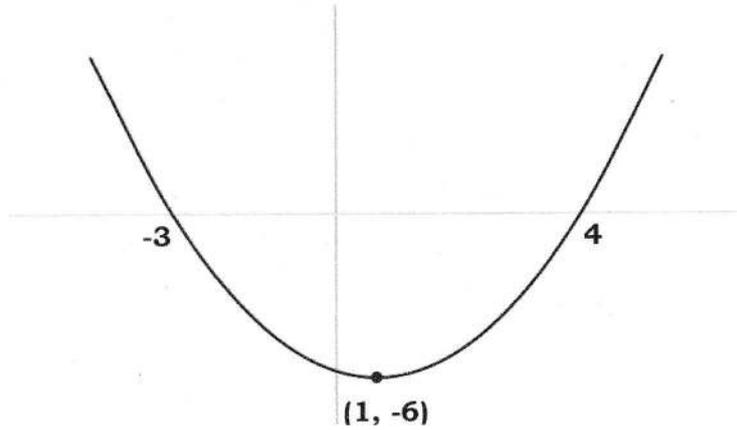
(c)  $y = -f(x)$



8.

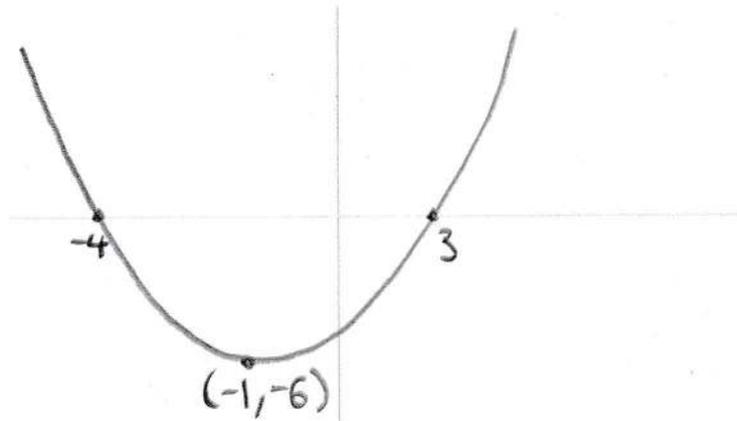
Pictured below is the curve  $y = f(x)$ .

The curve crosses the x axis at  $x = -3$  and  $x = 4$ , and has stationary point  $(1, -6)$ .

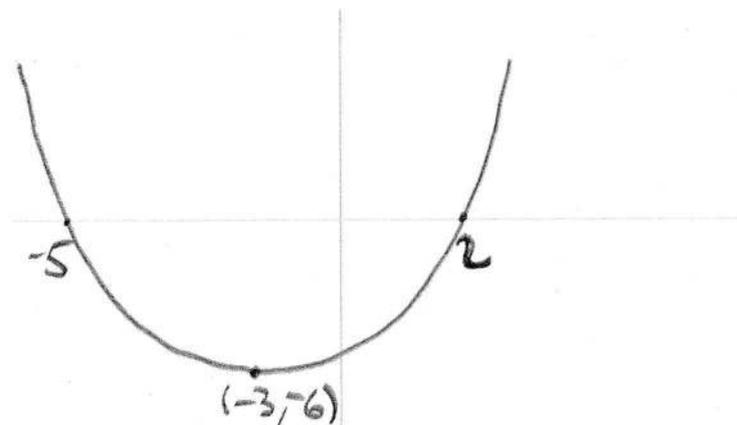


Sketch the following curves, clearly labelling where they cross the x axis and their stationary point:

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

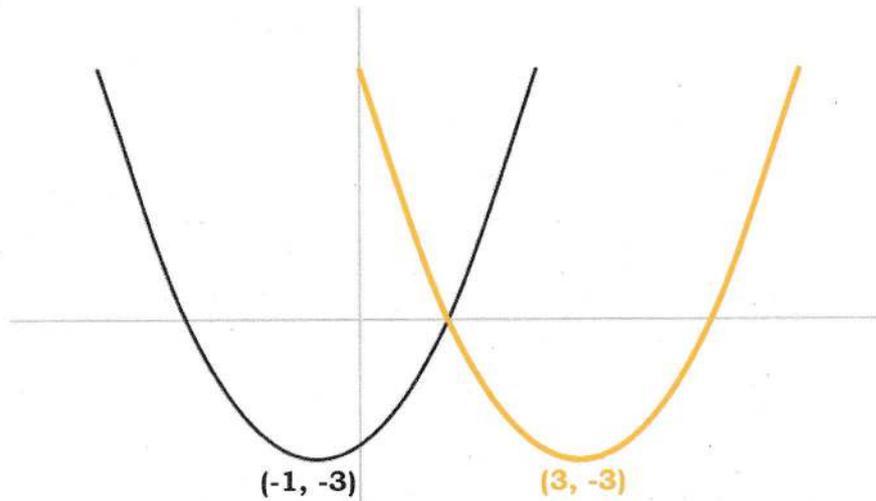


(b)  $y = f(x + 2)$



9.

Pictured below in black is the curve  $y = f(x)$ , with minimum point  $(-1, -3)$ .  
The curve is transformed into the yellow curve, with minimum point  $(3, -3)$ .



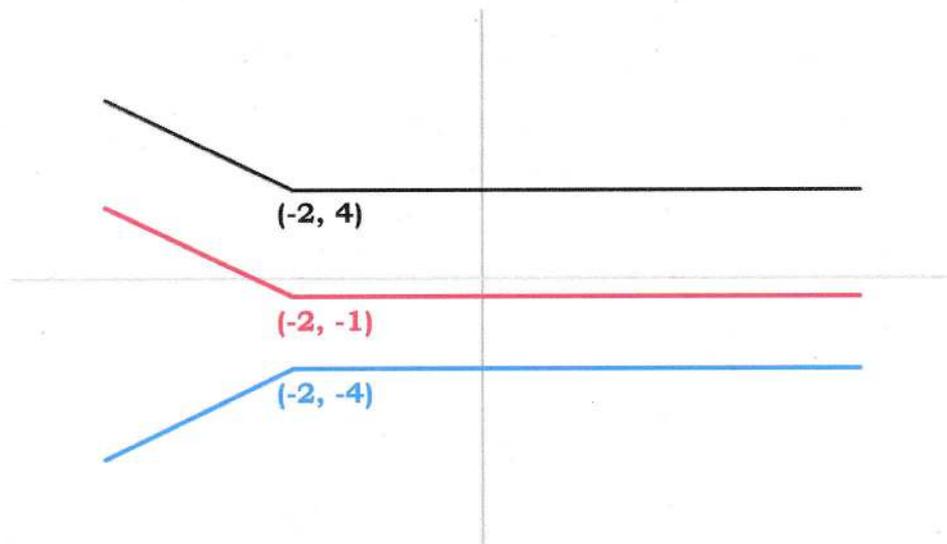
Write down the equation of the yellow curve.

$$y = f(x-4)$$

10.

Pictured below in black is the graph  $y = f(x)$ , with point P with co-ordinates  $(-2, 4)$ .  
The graph is transformed into the blue graph, changing the co-ordinates of point P to  $(-2, -4)$ .

The graph is also transformed into the red graph, changing the co-ordinates of point P to  $(-2, -1)$ .



(a) Write down the equation of the blue graph.

$$y = -f(x)$$

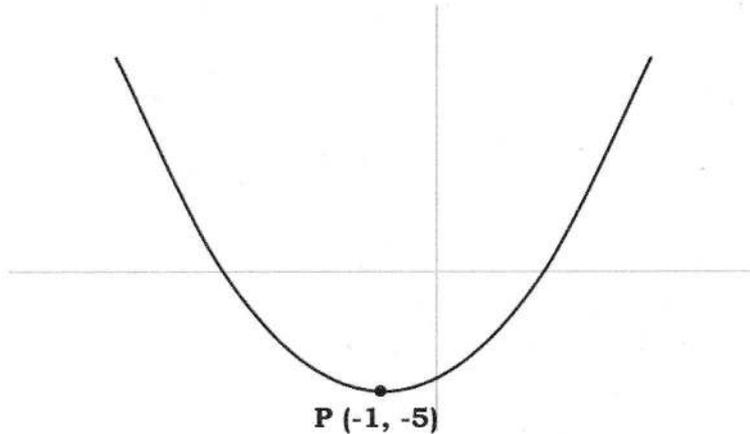
(b) Write down the equation of the red graph.

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

11.

Pictured below is the graph  $y = f(x)$ .

The point P is the stationary point of the graph, with co-ordinates  $(-2, 3)$ .



What are the co-ordinates of point P when  $y = f(x)$  is transformed to:

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

$(1, -5)$

(b)  $y = f(x + 2) + 3$

$(-3, -2)$

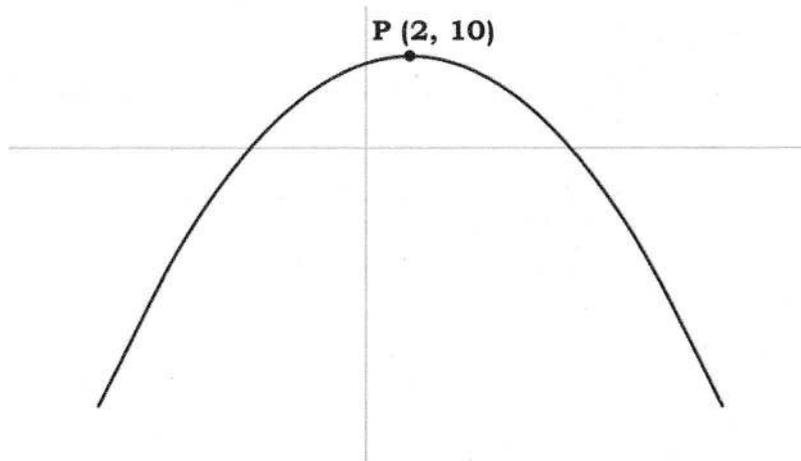
(c)  $y = 7 - f(x)$

$(-1, 12)$

12.

Pictured below is the graph  $y = f(x)$ .

The point P is the stationary point of the graph, with co-ordinates  $(2, 10)$ .



What are the co-ordinates of point P when  $y = f(x)$  is transformed to:

(a)  $y = f(x - 3) - 8$

$(5, 2)$

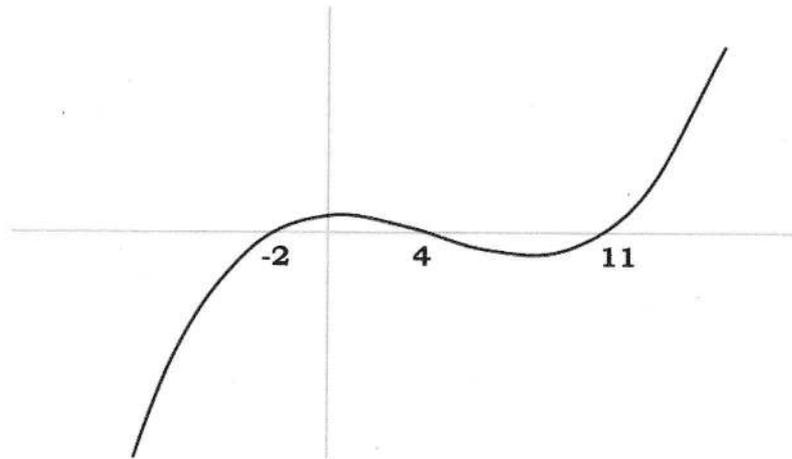
(b)  $y = f(-x) + 1$

$(-2, 11)$

13.

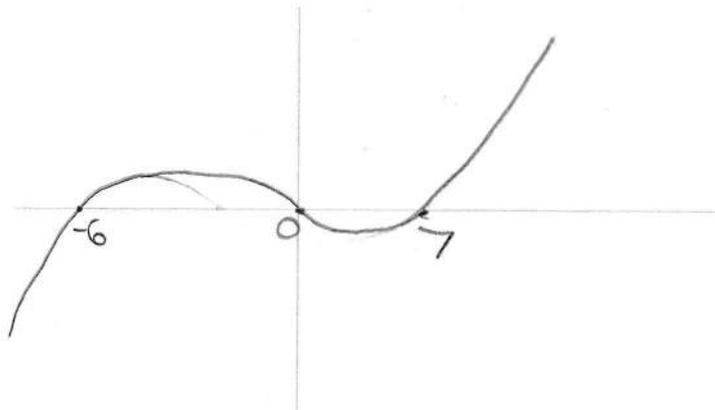
Pictured below is the curve  $y = f(x)$ .

The curve crosses the x axis at  $x = -2$ ,  $x = 4$  and  $x = 11$ .

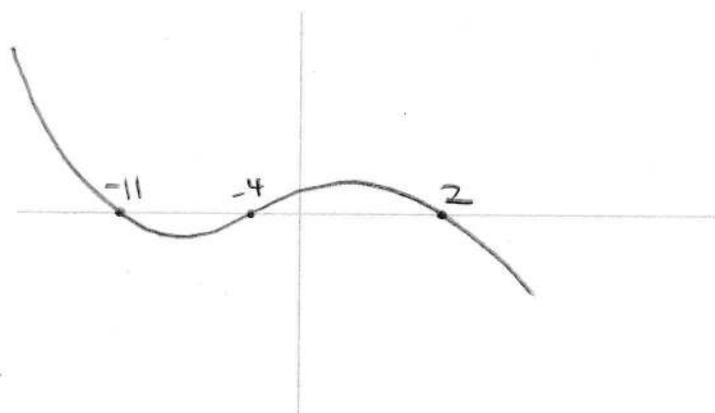


Sketch the following curves, clearly labelling where they cross the x axis:

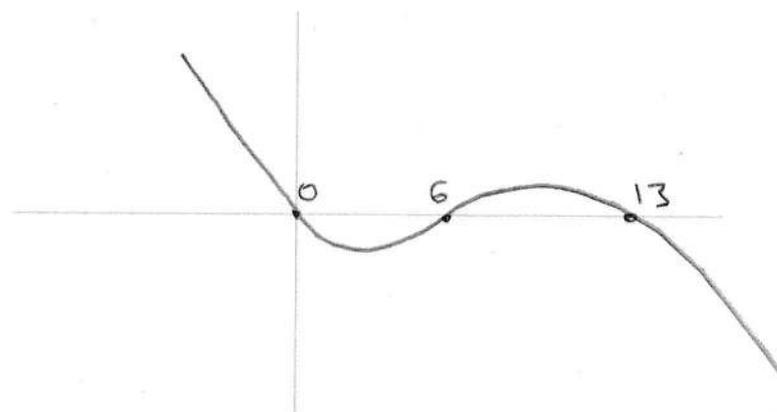
(a)  $y = f(x + 4)$



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



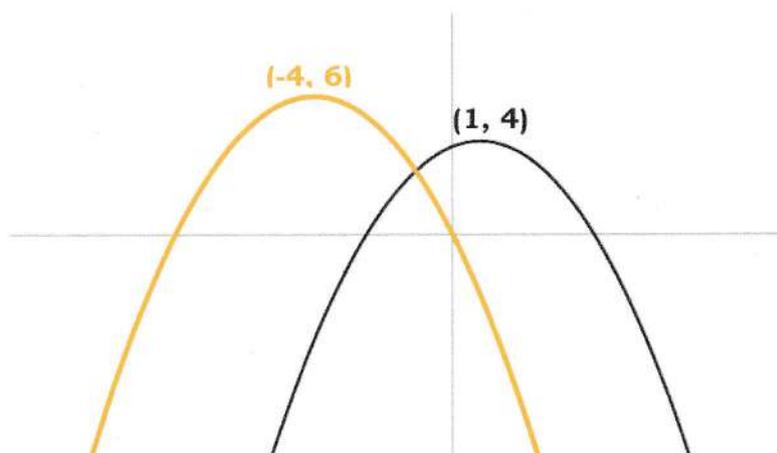
(c)  $y = -f(x - 2)$



14.

Pictured below in black is the curve  $y = f(x)$ , with stationary point  $(1, 4)$ .

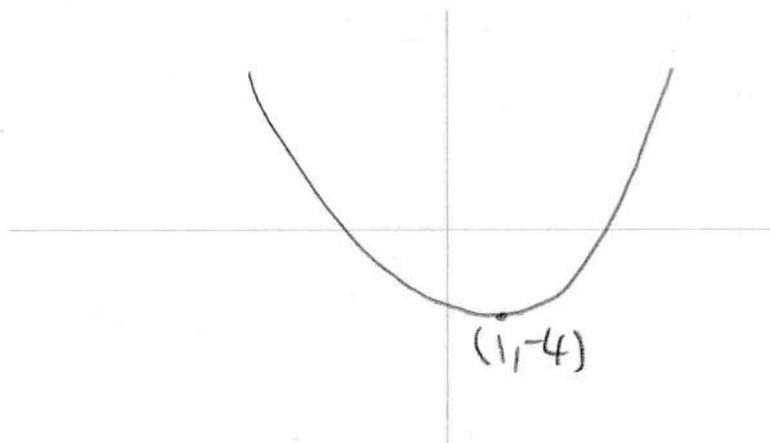
The curve is transformed into the yellow curve, with stationary point  $(-4, 6)$ .



(a) Find the equation of the yellow curve.

$$y = f(x+5) + 2$$

(b) On the axis below, sketch  $y = -f(x)$ , clearly labelling the stationary point of the curve.



(c) On the axis below, sketch  $y = f(-x) - 4$ , clearly labelling the stationary point of the curve.

