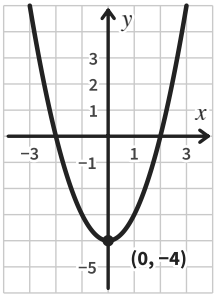
Graph translations

1

The graph of $y = f(x)$ is drawn.
Sketch $y = f(x) + 3$ on the grid.



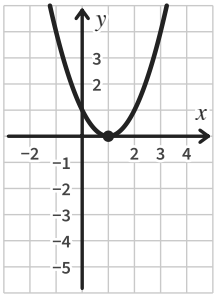
The graph moves up 3

Turning point

Column vector

2

The graph of $y = f(x)$ is drawn.
Sketch $y = f(x) - 4$ on the grid.



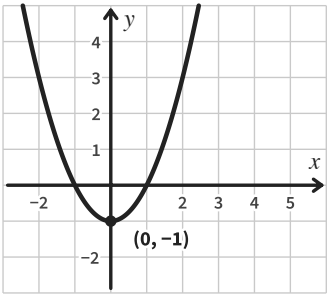
The graph moves

Turning point

Column vector

3 *Notice the change!*

The graph of $y = f(x)$ is drawn.
Sketch $y = f(x - 3)$ on the grid.



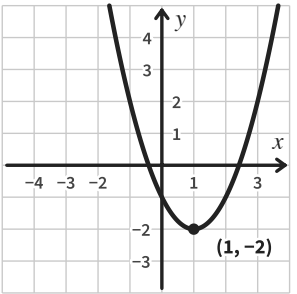
The graph moves

Turning point

Column vector

4

The graph of $y = f(x)$ is drawn.
Sketch $y = f(x + 2)$ on the grid.



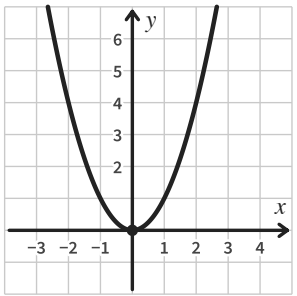
The graph moves

Turning point

Column vector

5 *Notice the change!*

The graph of $y = f(x) = x^2$ is drawn.
Sketch $y = f(x - 1) + 2$ on the grid.



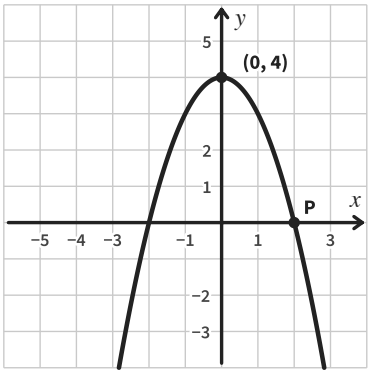
The graph moves

Turning point

Column vector

6

The graph of $y = f(x)$ is drawn.
Sketch $y = f(x + 3) - 2$ on the grid.

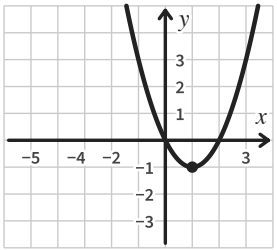


Turning point

P goes to

7

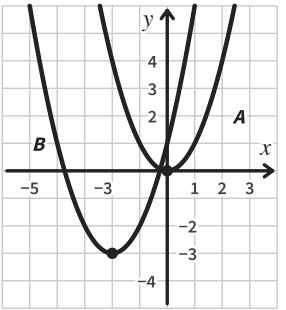
Sam says the graph of $y = f(x + 4)$ is the graph of $y = f(x)$ moved 4 to the right. Explain his mistake, and write down the turning point.



Turning point

8 *Notice the change!*

Curve A is $y = f(x) = x^2$. Curve B is curve A translated. Write down the column vector and the equation of curve B.



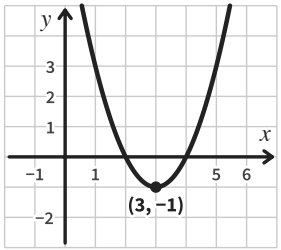
Column vector

Curve B

Graph translations *further practice*

9

The graph of $y = f(x)$ is drawn.
Sketch $y = f(x) + 4$ and write down its turning point.



Answer

10

The turning point of $y = f(x)$ is $(3, -5)$.
Write down the turning point of $y = f(x - 2)$.

Answer

11

The point $(-1, 6)$ is on $y = f(x)$.
Which point does it move to on $y = f(x + 5) - 6$?

Answer

12

Describe fully the single transformation that maps $y = f(x)$ onto $y = f(x + 3) - 1$.

Answer

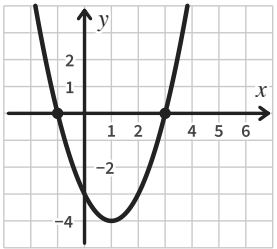
13

$f(x) = x^2$. The graph of $y = (x - 5)^2 + 2$ is a translation of $y = f(x)$. Write down the column vector.

Answer

14

The graph of $y = f(x)$ crosses the x axis at $x = -1$ and $x = 3$.
Where does $y = f(x - 2)$ cross the x axis?



Answer

15

In a computer game, a frog jumps along the curve $y = f(x)$.
The highest point of the jump is $(2, 5)$.
The next jump is the same curve moved 6 squares to the right.
Write down its equation and its highest point.

Answer

16

Jo says $y = f(x + 2) - 2$ and $y = f(x - 2) + 2$ are the same graph, because the numbers cancel.
Is she right? Explain.

Answer