

TRANSFORMATIONS OF GRAPHS

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Worked example

The point $A(2, 5)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

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

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

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

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

$$(3, 0)$$

Worked example

The point $A(2, 5)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

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

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

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

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

$(7, 4)$

Worked example

The point $A(2, 5)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = 5f(x)$$

$$y = \frac{3}{2}f(x)$$

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = \frac{3}{4}f(x)$$

$(3, 3)$

Worked example

The point $A(2, 5)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = f(2x)$$

$$y = f(5x)$$

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = f(3x)$$

$$(1, 4)$$

Worked example

The point $A(2, 5)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = f\left(\frac{1}{2}x\right)$$

$$y = f\left(\frac{1}{5}x\right)$$

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = f\left(\frac{1}{3}x\right)$$

$(9, 4)$

Worked example

The point $A(2, 5)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = -f(x)$$

$$y = f(-x)$$

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = -f(x)$$
$$(3, -4)$$

$$y = f(-x)$$
$$(-3, 4)$$

Worked example

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:

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

$$y = 3f(x) - 2$$

Your turn

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

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:

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

$$y = f(3x) - 2$$

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = f(5x) - 6$$

$$\left(\frac{3}{5}, -2\right)$$

Worked example

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:

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

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

Your turn

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

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:

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

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

Your turn

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

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:

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

$$y = -3f(x) - 2$$

Your turn

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

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:

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

$$y = 3f(-x) - 2$$

Your turn

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

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:

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

$$y = -3f(-x) - 2$$

Your turn

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

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:

$$y = 3f(2x) + 7$$

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

Your turn

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

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:

$$y = -3f(2x) + 7$$

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

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = -5f(3x) - 7$$

$$(1, -27)$$

Worked example

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:

$$y = -3f(-2x) + 7$$

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

Your turn

The point $A(3, 4)$ is on the graph of $y = f(x)$. Write the new coordinates of A after the transformation:

$$y = -5f(-3x) - 7$$

$$(-1, -27)$$