

Graph Transformations

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **21**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** The graph of $y = f(x)$ is translated to the graph of $y = f(x - 6)$
 $(4, -3)$ is a point on the translated graph.
Circle the point on the graph of $y = f(x)$ that moves to $(4, -3)$

[1 mark]

$(10, -3)$

$(-2, -3)$

$(4, -9)$

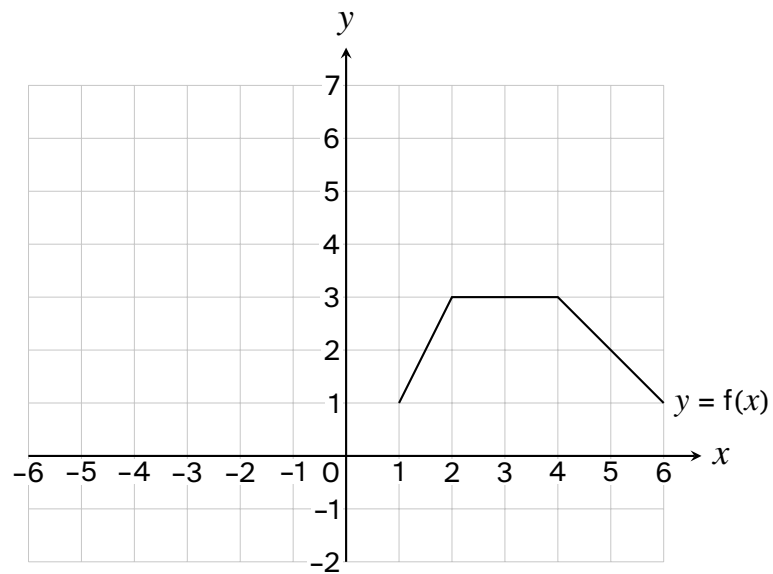
$(4, 3)$

- 2** Describe fully the single transformation that maps the graph of $y = x^2$ onto the graph of $y = (x - 3)^2$

[2 marks]

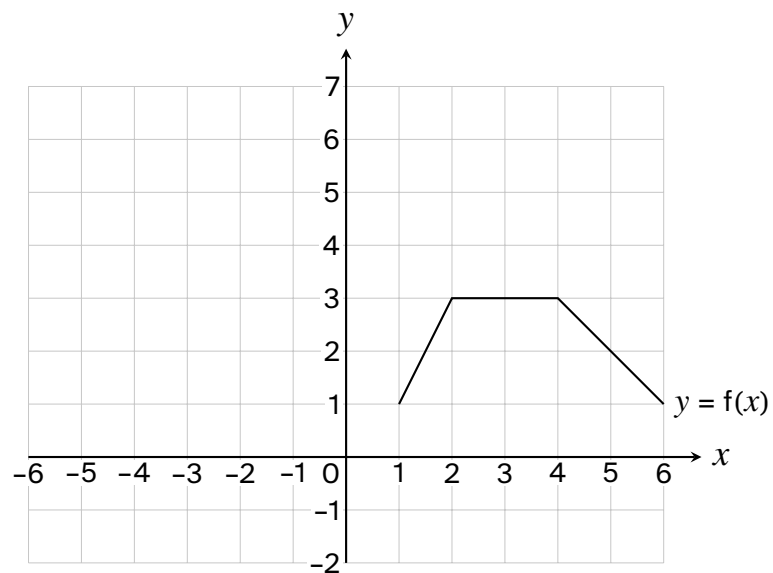
3 The graph of $y = f(x)$ is drawn on each grid.

(a) On the grid, draw the graph of $y = f(x) + 3$



[2 marks]

(b) On the grid, draw the graph of $y = f(-x)$



[2 marks]

- 4** The curve $y = f(x)$ has a maximum point at $(-3, 4)$
Write down the coordinates of the maximum point of the curve

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

[1 mark]

Answer (_____)

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

[1 mark]

Answer (_____)

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

[1 mark]

Answer (_____)

- 5** (a) The graph of $y = \frac{1}{x}$ is translated by the vector $\begin{pmatrix} 5 \\ 0 \end{pmatrix}$
Write down the equation of the translated graph.

[1 mark]

Answer _____

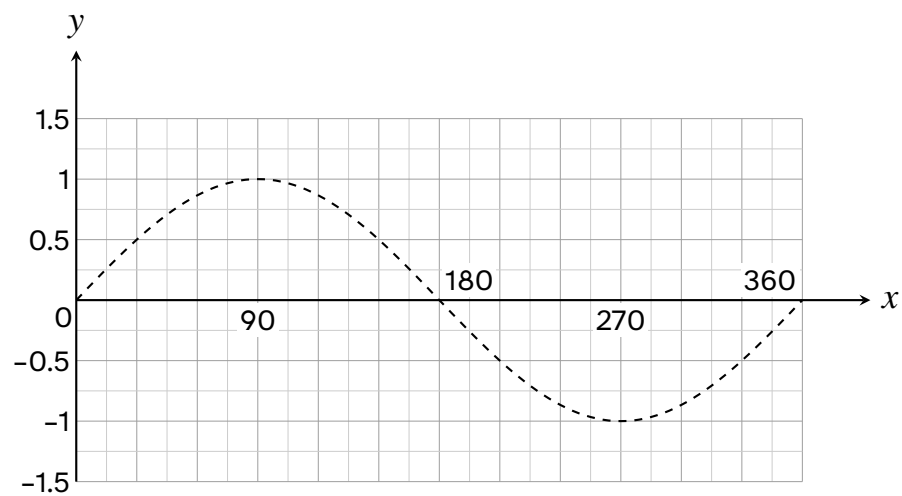
- (b) The graph of $y = 2x + 7$ is reflected in the x -axis.
Write down the equation of the reflected graph.

[1 mark]

Answer _____

6 The graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$ is shown as a dashed line on the grid.

(a) On the grid below, draw the graph of $y = -\sin x$ for $0^\circ \leq x \leq 360^\circ$



[1 mark]

(b) The graph of $y = \sin x$ is translated by the vector $\begin{pmatrix} 90 \\ 2 \end{pmatrix}$

Write down the coordinates of the image of the maximum point of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$

[1 mark]

Answer (_____ , _____)

7 The graph of $y = x^2$ is translated to give graph B .

Graph B has equation $y = x^2 - 8x + 19$

Work out the vector of the translation.

[3 marks]

Answer $\begin{pmatrix} \\ \end{pmatrix}$

- 8** The curve $y = x^3 - 4x$ is translated 1 unit to the left and 3 units up.
The translated curve has equation $y = g(x)$
Show that $g(x) = x^3 + 3x^2 - x$

[4 marks]