Graph transformations

Please write clearly in block capitals

Forename:
Surname:

Materials

For this paper you must have:
- mathematical instruments

You must *not* use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.

1   For a curve y = f(x), describe the following transformations: *(Level 6)*

1(a) $f(x - 1)$

[1 mark]

_____

_____

_____

1(b) $f(x) + 7$

[1 mark]

_____

_____

_____

1(c) $f(x + 5)$

[1 mark]

_____

_____

_____

Turn over for next question

3

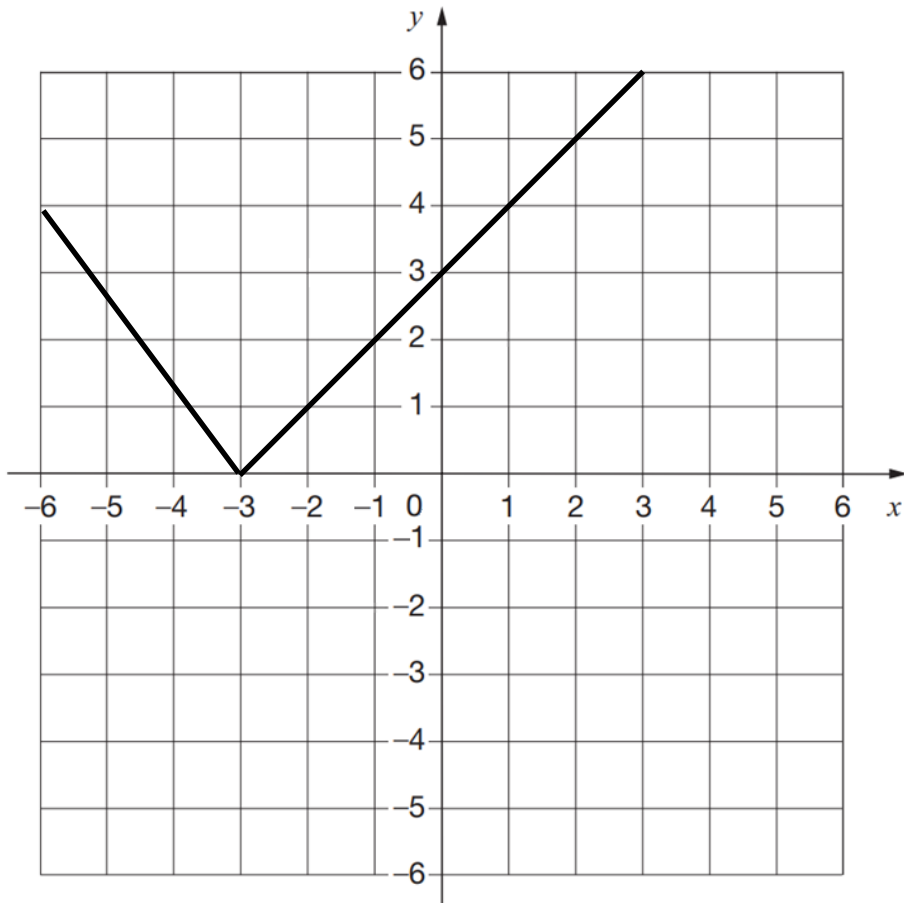**2** The graph of $y = f(x)$ has been drawn below.

(Level 7)

On the same axes, draw the graphs of the following, labelling them A,B and C respectively.

$$f(x) + 2$$
$$f(x - 3)$$
$$f(x + 1) - 1$$

[4 marks]

4

Turn over ►

3   The graph of $y = f(x)$ has been drawn below. On the same axes, draw the graphs of   *(Level 7)*
the following, labelling them A,B and C respectively.

$$f(-x)$$

$$-f(x)$$

$$f(x-2)$$

[3 marks]

3

4   The graph of $y = f(x)$ has been drawn below.   *(Level 7)*
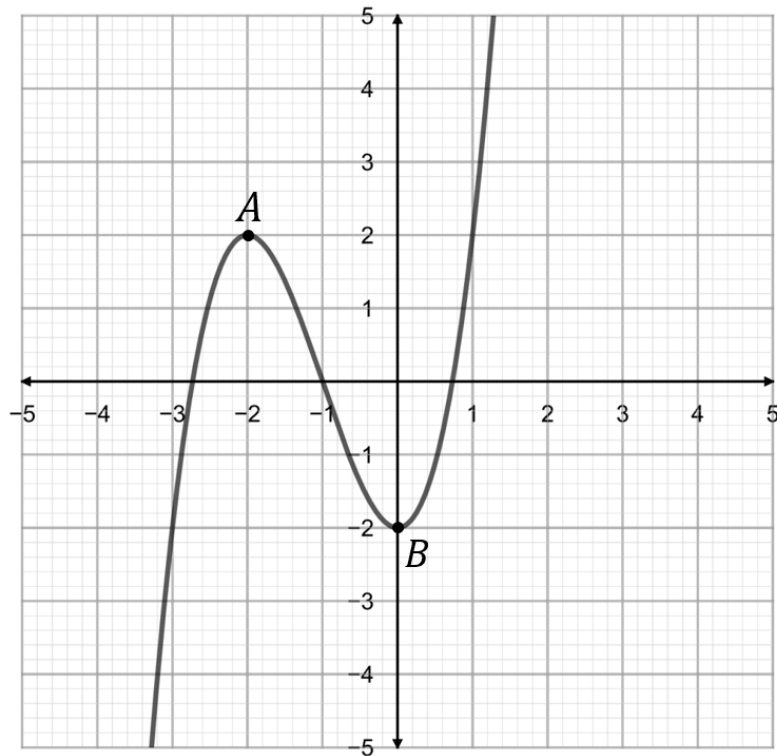
4(a)   Write down the new co-ordinates of the points A, B, under the following transformations:

$$-f(x)$$

[3 marks]

_____

$A =$ _____

$B =$ _____

4(b) $f(x - 3)$

[3 marks]

_____

$A =$ _____

$B =$ _____
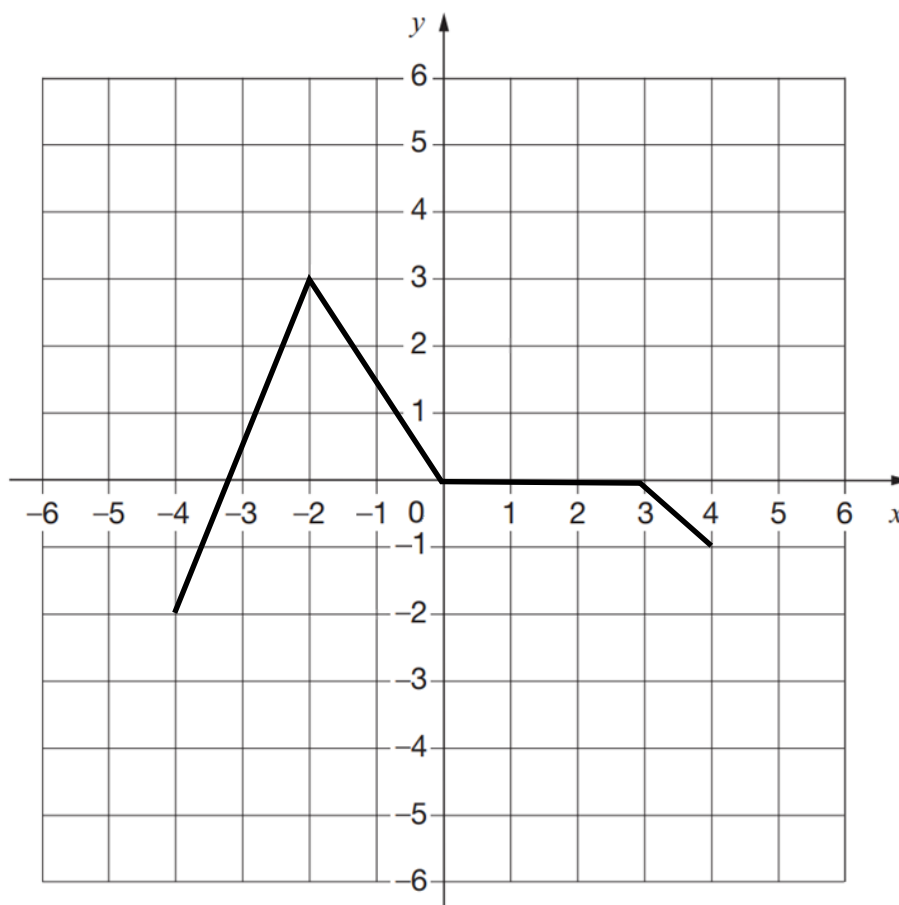
Turn over for next question

6

Turn over ▶

5(a)   The graph of $y = f(x)$ has been drawn below. One the same axes, draw the graphs   *(Level 7)*
of:

$$f(x + 3)$$

$$f(x) - 3$$

Label the two graphs A and B respectively

[4 marks]

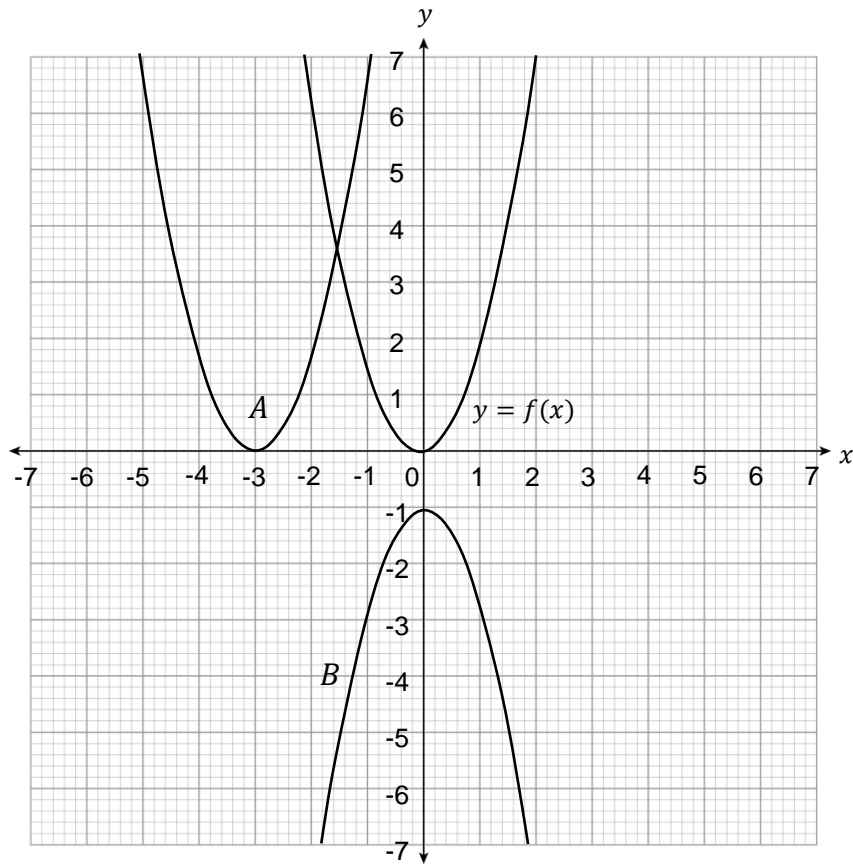**5(b)**   What transformation(s) need to be made to transform A into B?

[2 marks]

Answer _____

Turn over for next question

6

Turn over ▶

6   The three graphs marked on the axes below are all transformations of $y = f(x)$ *(Level 8)*

Determine the transformations that have taken place to transform $y = f(x)$ into the following

6(a) $y = f(x)$ into A

[1 marks]

Answer _____

6(b) $y = f(x)$ into B

[1 marks]

Answer _____

End of questions

2

END