MME

GCSE MATHEMATICS
AQA | Edexcel | OCR | WJEC

Inverse and Composite Functions

Please write clearly in block capitals

Forename:
Surname:

Materials

For this paper you must have:
• mathematical instruments

You *can* 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   Given that $f(x) = x - 9$, find:

1(a) $f^{-1}(x)$

[1 mark]

Answer _____

1(b) $f^{-1}(4)$

[1 mark]

Answer _____

2   Given that $f(x) = 5x - 3$, find:

2(a) $f^{-1}(x)$

[1 mark]

Answer _____

2(b) $f^{-1}(3)$

[1 mark]

Answer _____

Turn over for next question

4

Turn over ▶

3   Given that $f(x) = \frac{x-8}{3}$, find:

3(a) $f^{-1}(x)$

[1 mark]

Answer _____

3(b) $f^{-1}(10)$

[1 mark]

Answer _____

4   Given that $f(x) = \sqrt{\frac{-x+2}{4}}$, find:

4(a) $f^{-1}(x)$

[2 marks]

Answer _____

4(b) $f^{-1}(3)$

[2 marks]

Answer _____

Turn over for next question

6

Turn over ▶

5   Functions f and g are defined by $f(x) = 2x + 4$ and $g(x) = 3x + 1$.

5(a)   Find the value of x when $f(x) = g(x)$

[1 mark]

_____

_____

_____

_____

Answer   _____

5(b)   Find and simplify the expression for $fg(x)$

[2 marks]

_____

_____

_____

Answer   _____

5(c)   Find and simplify the expression for $gf(x)$

[2 marks]

_____

_____

_____

_____

Answer   _____

Turn over for next question

5

Turn over ▶

6 Given that $f(x) = \frac{5}{x-1}$ and $g(x) = 4 - 2x$, find:

6(a) $ff^{-1}(-2)$

[2 marks]

_____

_____

_____

_____

Answer _____

6(b) $gg(3)$

[2 marks]

_____

_____

_____

_____

Answer _____

6(c) A simplified expression for $fg(x)$.

[2 marks]

_____

_____

_____

_____

Answer _____

Turn over for next question

6

Turn over ►

7(a) Given that $f(x) = x^2 - a$ and $g(x) = x + b$, find an expression for $fg(x)$ in terms of a and b.

[2 marks]

Answer _____

7(b) If $b = 2a$, and $a = -3$, what is the value of $fg(5)$?

[2 marks]

Answer _____

End of Questions