Name: _____

GCSE (1 – 9)

Compound and Inverse Functions

Instructions

• Use **black** ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
• You must **show all your working out.**

Information

• The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end

1 Given that $f(x) = x - 4$ find:

(a) f(5)

(b) f(3)

.....

(1)

.....

(1)

(Total for Question 1 is 2 marks)

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2 Given that $g(x) = 2x^2 - 10$ find:

(a) g(2)

.....

(1)

(b) g(-2)

.....

(1)

(c) Solve: $g(x) = 8$

.....

(3)

(Total for Question 2 is 5 marks)

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

(a) f(3)

.....

(1)

(b) f(-2)

.....

(1)

(c) Solve $f(x) = 1$

.....

(2)

(Total for Question 3 is 4 marks)

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4 Given that $f(x) = x^2 - 3$ find:

(a) f(10)

.....

(1)

(b) f(-1)

.....

(1)

(c) Solve: $f^{-1}(x) = 8$

.....

(2)

(Total for Question 4 is 4 marks)

5 Given that $f(x) = 2x - 4$ and $g(x) = 3x + 5$

(a) Find $gf(3)$

.....

(2)

(b) Work out an expression for $f^{-1}(x)$

.....

(2)

(c) Solve $f(x) = g(x)$

.....

(2)

(Total for Question 5 is 6 marks)

6 Given that $f(x) = 3x + 1$ and $g(x) = x^2$

(a) Find $fg(x)$

.....

(2)

(b) Work out an expression for $gf(x)$

.....

(2)

(c) Solve $fg(x) = gf(x)$

.....

(3)

(Total for Question 6 is 7 marks)

7 Given that $f(x) = x^2 - 17$ and $g(x) = x + 3$

(a) Work out an expression for $g^{-1}(x)$

.....

(2)

(b) Work out an expression for $f^{-1}(x)$

.....

(2)

(c) Solve $f^{-1}(x) = g^{-1}(x)$

.....

(4)

(Total for Question 7 is 8 marks)

8 The function f is defined such that

$$f(x) = x^2 - 1$$

(a) Find an expression for $f(x - 2)$

.....

(2)

(b) Hence solve: $f(x - 2) = 0$

.....

(2)

(Total for Question 8 is 4 marks)

9 The function f is defined such that

$$f(x) = 4x - 1$$

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

.....

(2)

The function g is defined such that

$$g(x) = kx^2 \text{ where } k \text{ is a constant}$$

(b) Given that $fg(2) = 12$
Work out the value of k.

.....

(2)

(Total for Question 9 is 4 marks)