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) $f(5)$

..... (1)

b) $f(3)$

..... (1)

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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)

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

a) $f(3)$

..... (1)

b) $f(-2)$

..... (1)

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

..... (2)

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

a) $f(10)$

..... (1)

b) $f(-1)$

..... (1)

c) *Find* : $f^{-1}(x)$

..... (2)

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)

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

a) Write down an expression for: $fg(x)$

..... (2)

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

..... (2)

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

..... (3)

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)

8. A function f is defined such that

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

a) Find and expression for : $f(x-2)$

..... (2)

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

..... (2)

9. A function f is defined such that

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

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

..... (2)

The function g is such that

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

Given that $fg(2)=12$

b) Work out the value of k

..... (2)