

Functions

Difficulty: Medium

Question Paper 1

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Functions
Paper	Paper 4
Difficulty	Medium
Booklet	Question Paper 1

Time allowed: 72 minutes

Score: /63

Percentage: /100

Grade Boundaries:

CIE IGCSE Maths (0580)

A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

Question 1

$$f(x) = 3 - 2x$$

$$g(x) = \frac{4}{x}, x \neq 0$$

$$h(x) = 4^x$$

(a) Find $f(5)$. [1]

(b) Find $gh(3)$. [2]

(c) Find $f^{-1}(x)$. [2]

(d) Show that $hf(x) = \frac{64}{16^x}$. [3]

(e) Find the value of x when $h(x) = g(0.5)$. [2]

Question 2

$$f(x) = 3x - 2$$

$$g(x) = x^2$$

$$h(x) = 3^x$$

(a) Find $f(-3)$. [1]

(b) Find the value of x when $f(x) = 19$. [2]

(c) Find $fh(2)$. [2]

(d) Find $gf(x) + f(x) + x$. [3]
Give your answer in its simplest form.

(e) Find $f^{-1}(x)$. [2]

Question 3

(a) $y = \frac{3}{x} + 2, \quad x \neq 0$

(i) Find the value of y when $x = -6$. [1]

(ii) Find x in terms of y . [3]

(b) $g(x) = 2 - x$ $h(x) = 2^x$

(i) Find $g(5)$. [1]

(ii) Find $hhh(2)$. [2]

(iii) Find x when $g(x) = h(3)$.

[2]

(iv) Find x when $g^{-1}(x) = -1$.

[1]

Question 4

$$f(x) = 2 - 3x$$

$$g(x) = 7x + 3$$

(a) Find

(i) $f(-3)$, [1]

(ii) $g(2x)$. [1]

(b) Find $gf(x)$ in its simplest form. [2]

(c) Find x when $3f(x) = 7$. [3]

(d) Solve the equation.

$$f(x + 4) - g(x) = 0$$
 [3]

Question 5

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

$$g(x) = \frac{1}{x}, \quad x \neq 0$$

$$h(x) = 2^x$$

(a) Find $h(3)$. [1]

(b) Find $fg(0.5)$. [2]

(c) Find $f^{-1}(x)$. [2]

(d) Find $ff(x)$, giving your answer in its simplest form. [2]

(e) Find $(f(x))^2 + 6$, giving your answer in its simplest form. [2]

(f) Simplify $hh^{-1}(x)$. [1]

(g) Which of the following statements is true?

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

$$g^{-1}(x) = g(x)$$

$$h^{-1}(x) = h(x)$$

[1]

(h) Use two of the functions $f(x)$, $g(x)$ and $h(x)$ to find the composite function which is equal to $2^{x+1} - 1$.

[1]

Question 6

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

$$g(x) = x^2 + x$$

$$h(x) = \frac{2}{x}, x \neq 0$$

(a) Find $ff(3)$. [2]

(b) Find $gf(x)$, giving your answer in its simplest form. [3]

(c) Find $f^{-1}(x)$. [2]

(d) Find $h(x) + h(x + 2)$, giving your answer as a single fraction. [4]