

Functions

Difficulty: Medium

Question Paper 2

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Functions
Paper	Paper 4
Difficulty	Medium
Booklet	Question Paper 2

Time allowed: 82 minutes

Score: /71

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

$$f(x) = 5x - 2$$

$$g(x) = \frac{7}{x - 3}, x \neq 3$$

$$h(x) = 2x^2 + 7x$$

(a) Work out

(i) $f(2)$, [1]

(ii) $hg(17)$. [2]

(b) Solve $g(x) = x + 3$. [3]

(c) Solve $h(x) = 11$, showing all your working and giving your answers correct to 2 decimal places. [5]

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

(e) Solve $g^{-1}(x) = -0.5$. [1]

Question 2

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

$$g(x) = 1 - x$$

$$h(x) = x^2 + 1$$

(a) Find $fg\left(\frac{1}{2}\right)$. [2]

(b) Find $g^{-1}(x)$, the inverse of $g(x)$. [1]

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

(d) Find the value of x when $g(x) = 7$. [1]

(e) Solve the equation $h(x) = 3x$.
Show your working and give your answers correct to 2 decimal places. [4]

(f) A function $k(x)$ is its own inverse when $k^{-1}(x) = k(x)$.
For which of the functions $f(x)$, $g(x)$ and $h(x)$ is this true? [1]

Question 3

$$f(x) = 4 - 3x \qquad g(x) = 3^{-x}$$

(a) Find $f(2x)$ in terms of x . [1]

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

(c) Work out $gg(-1)$.
Give your answer as a fraction. [3]

(d) Find $f^{-1}(x)$, the inverse of $f(x)$. [2]

(e) Solve the equation $gf(x) = 1$. [3]

Question 4

$$f(x) = 4x + 3 \quad g(x) = \frac{7}{x+1} \quad (x \neq -1) \quad h(x) = x^2 + 5x$$

(a) Work out

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

(ii) $hg(13)$. [2]

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

(c) (i) Solve the equation $f(x) = 23$. [2]

(ii) Solve the equation $h(x) = 7$.

Show all your working and give your answers correct to 2 decimal places. [5]

Question 5

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

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

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

(a) Find the value of $hg(-2)$. [2]

(b) Find $g^{-1}(x)$. [2]

(c) Solve the equation $f(x) = 0$. [4]
Show all your working and give your answers correct to 2 decimal places.

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

(e) Solve the equation $h^{-1}(x) = 2$. [1]

Question 6

$$f(x) = 6 + x^2$$

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

(a) Find

(i) $g(3)$, [1]

(ii) $f(-4)$. [1]

(b) Find the inverse function $g^{-1}(x)$. [2]

(c) Find $fg(x)$ in its simplest form. [3]

(d) Solve the equation $gg(x) = 3$. [3]