Functions
Difficulty: Hard

Question Paper 2

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

Time allowed: **81 minutes**

Score: **/70**

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%

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

Work out

(i) f(2), [1]

(ii) g(−2), [1]

(iii) ff(x) in its simplest form, [2]

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

(v) x when gf(x) = 4. [4]

(b) y is **inversely** proportional to x and $y = 8$ when $x = 2$.

Find,

(i) an equation connecting y and x, [2]

(ii) y when $x = \frac{1}{2}$. [1]

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

(a) Find the value of

(i) $f\left(-\frac{1}{2}\right)$, [1]

(ii) g (-5) [1]

(iii) h (–3) . [1]

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

(c) $g(x) = z$.
Find x in terms of z. [2]

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

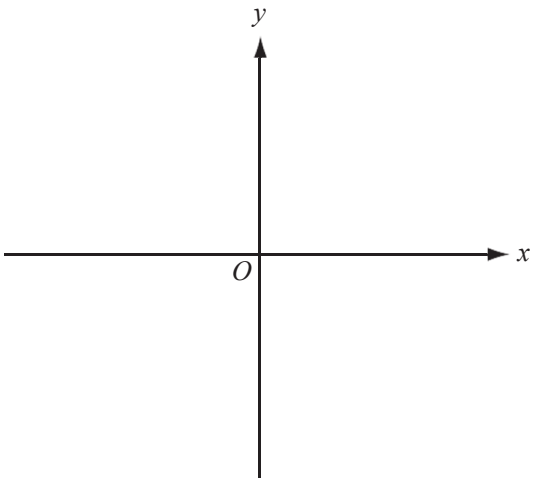
(e) $h(x) = 512$.
Find the value of x. [1]

(f) Solve the equation $2f(x) + g(x) = 0$, giving your answers correct to 2 decimal places. [5]

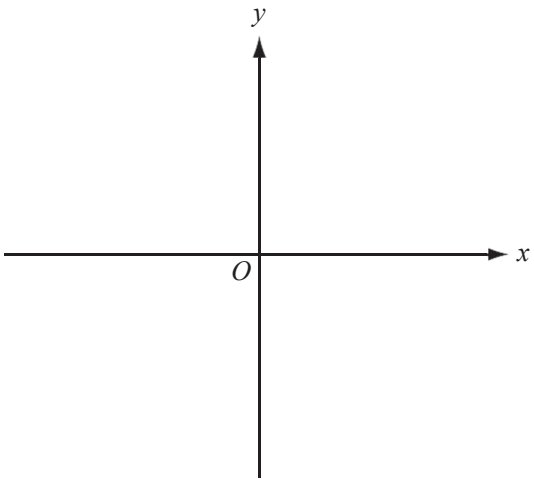
(g) Sketch the graph of

(i) $y = f(x)$,

(ii) $y = g(x)$.



(i) $y = f(x)$



(ii) $y = g(x)$ [3]

$f(x) = 2x - 1$, $g(x) = \frac{3}{x} + 1$, $h(x) = 2^x$.

(a) Find the value of fg(6). [1]

(b) Write, as a **single fraction**, gf(x) in terms of x. [3]

(c) Find $g^{-1}(x)$. [3]

(d) Find hh(3). [2]

(e) Find x when $h(x) = g\left(-\frac{24}{7}\right)$ [2]

Question 4

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$f(x) = x^2 - 4x + 3$ and $g(x) = 2x - 1$.

(a) Solve $f(x) = 0$. [2]

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

(c) Solve $f(x) = g(x)$, giving your answers correct to 2 decimal places. [5]

(d) Find the value of $gf(-2)$. [2]

(e) Find $fg(x)$. Simplify your answer. [3]

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(a) $f(x) = 2 - 3x$ and $g(x) = x^2$.

(i) Solve the equation $f(x) = 7 - x$. [2]

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

(iii) Find the value of $gf(2) - fg(2)$. [3]

(iv) Find $fg(x)$. [1]

(b) $h(x) = x^x$.

(i) Find the value of $h(2)$. [1]

(ii) Find the value of $h(-3)$, giving your answer as a fraction. [1]

(iii) Find the value of $h(7.5)$, giving your answer in standard form. [2]

(iv) $h(-0.5)$ is not a real number. Explain why. [1]

(v) Find the integer value for which $h(x) = 3125$. [1]