

Functions

Difficulty: Hard

Question Paper 2

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|------------|--------------------|
| Level | IGCSE |
| Subject | Maths (0580/0980) |
| Exam Board | CIE |
| Topic | Algebra and graphs |
| Sub-Topic | Functions |
| Paper | Paper 2 |
| Difficulty | Hard |
| Booklet | Question Paper 2 |

Time allowed: 32 minutes

Score: /25

Percentage: /100

Grade Boundaries:

CIE IGCSE Maths (0580)

| A* | A | B | C | D | E |
|------|-----|-----|-----|-----|-----|
| >88% | 76% | 63% | 51% | 40% | 30% |

CIE IGCSE Maths (0980)

| 9 | 8 | 7 | 6 | 5 | 4 | 3 |
|------|-----|-----|-----|-----|-----|-----|
| >94% | 85% | 77% | 67% | 57% | 47% | 35% |

Question 1

$$f(x) = (x + 2)^3 - 5 \qquad g(x) = 2x + 10 \qquad h(x) = \frac{1}{x}, x \neq 0$$

Find

(a) $gf(x)$, [2]

(b) $f^{-1}(x)$, [3]

(c) $gh\left(-\frac{1}{5}\right)$. [2]

Question 2

$$f(x) = (x - 1)^3 \quad g(x) = (x - 1)^2 \quad h(x) = 3x + 1$$

(a) Work out $fg(-1)$.

[2]

(b) Find $gh(x)$ in its simplest form.

[2]

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

[2]

Question 3

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

(i) Find $f(-5)$. [1]

(ii) $g(x) = 3x - 2$.

Find $gf(x)$. Simplify your answer. [2]

(b) $h(x) = x^2 - 5x - 11$.

Solve $h(x) = 0$. [4]

Show all your working and give your answer correct to 2 decimal places.

Question 4

$$f: x \rightarrow 1 - 2x \text{ and } g: x \rightarrow \frac{x}{2}.$$

(a) Find $fg(7)$. [2]

(b) (i) Solve $f(x) = g(x)$. [2]

(ii) The graphs of $y = f(x)$ and $y = g(x)$ meet at M .
Find the coordinates of M . [1]