

Functions

Question Paper 6

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Algebra and Graphs
Sub-Topic	Functions
Booklet	Question Paper 6

Time Allowed: 57 minutes

Score: /47

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1 $f(x) = 3x + 5$ $g(x) = 7 - 2x$ $h(x) = x^2 - 8$

(a) Find

(i) $f(3)$,

Answer(a)(i) [1]

(ii) $g(x - 3)$ in terms of x in its simplest form,

Answer(a)(ii) [2]

(iii) $h(5x)$ in terms of x in its simplest form.

Answer(a)(iii) [1]

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

Answer(b) $g^{-1}(x) =$ [2]

(c) Find $hf(x)$ in the form $ax^2 + bx + c$.

Answer(c) $hf(x) =$ [3]

(d) Solve the equation $ff(x) = 83$.

Answer(d) $x =$ [3]

(e) Solve the inequality $2f(x) < g(x)$.

Answer(e) [3]

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

(a) Find the value of

(i) $gf(2)$,

Answer(a)(i) [2]

(ii) $h(-2)$.

Answer(a)(ii) [1]

(b) Find $fg(x)$.

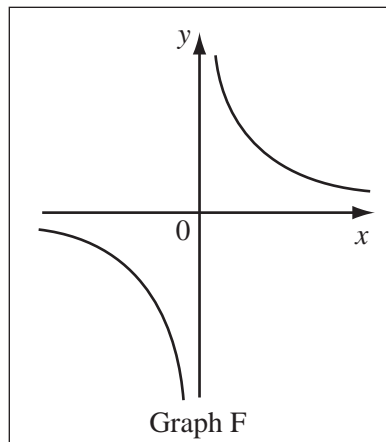
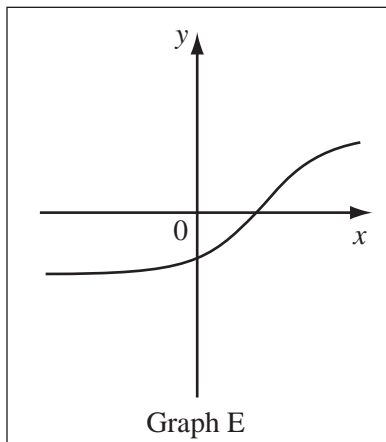
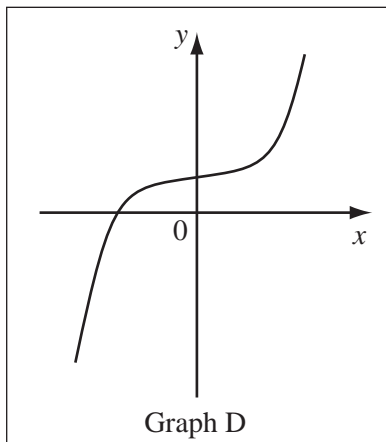
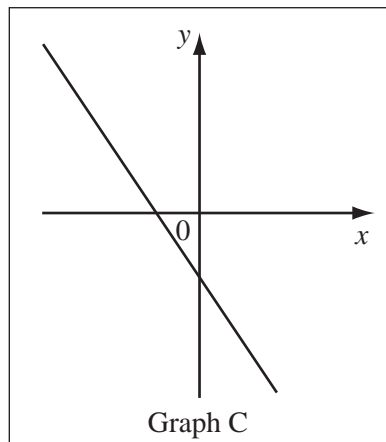
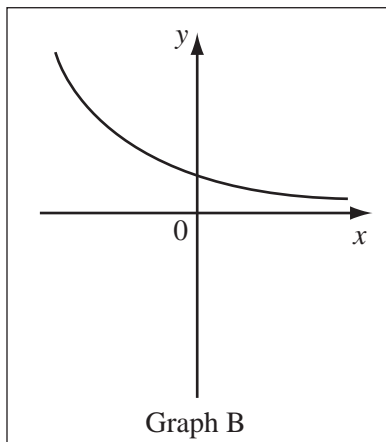
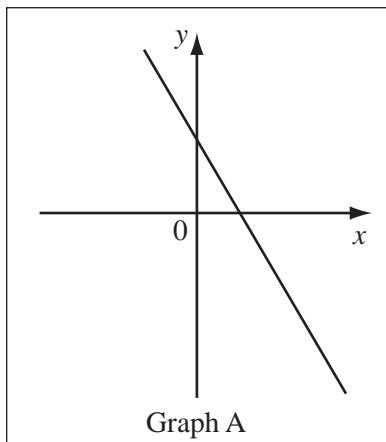
Write your answer as a single fraction.

Answer(b) $fg(x) =$ [2]

(c) Find $h^{-1}(x)$, the inverse of $h(x)$.

Answer(c) $h^{-1}(x) =$ [2]

(d) Write down which of these sketches shows the graph of each of $y = f(x)$, $y = g(x)$ and $y = h(x)$.



Answer(d) $y = f(x)$ Graph

$y = g(x)$ Graph

$y = h(x)$ Graph [3]

(e) $k(x) = x^5 - 3$

Solve the equation $k^{-1}(x) = 2$.

Answer(e) $x =$ [2]

3

$$f(x) = \frac{1}{x+4} \quad (x \neq -4)$$

$$g(x) = x^2 - 3x$$

$$h(x) = x^3 + 1$$

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

Answer(a) [2]

(b) Find $h^{-1}(x)$.

Answer(b) $h^{-1}(x) =$ [2]

(c) Solve the equation $g(x) = -2$.

Answer(c) $x =$ or $x =$ [3]

4

$$f(x) = 4x - 2$$

$$g(x) = \frac{2}{x} + 1$$

$$h(x) = x^2 + 3$$

(a) (i) Find the value of $hf(2)$.

Answer(a)(i) [2]

(ii) Write $fg(x)$ in its simplest form.

Answer(a)(ii) $fg(x) =$ [2]

(b) Solve $g(x) = 0.2$.

Answer(b) $x =$ [2]

(c) Find the value of $gg(3)$.

Answer(c) [2]

(d) (i) Show that $f(x) = g(x)$ can be written as $4x^2 - 3x - 2 = 0$.

Answer (d)(i)

[1]

(ii) Solve the equation $4x^2 - 3x - 2 = 0$.

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

Answer(d)(ii) $x =$ or $x =$ [4]