



THIRD SPACE
LEARNING

GCSE Exam Questions

Composite and Inverse Functions
| Algebra

GCSE Exam Questions: Composite and Inverse Functions

1) Let $f(x) = x^2$ and $g(x) = \frac{x - 40}{3}$.

(a) Find $fg(31)$.

(2)

(b) Find the values of x when $f(x) = g^{-1}(x)$.

(4)
(6 marks)

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

(a) Find $fg(x)$.

(2)

(b) Find when $fg(x) = gf(x)$.

(4)
(6 marks)

3) Let $f(x) = \frac{x + 5}{x + 3}$.

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

(4 marks)

4) Let $g(x) = 2x + 7$ and $h(x) = x(x + 3)$.

(a) Find an expression for $hg(x)$.

(3)

(b) Find the values of x when $h(x) = g^{-1}(15)$.

(4)
(7 marks)

GCSE Exam Questions: Composite and Inverse Functions Answers

	Question	Answer	Marks
1) (a)	Let $f(x) = x^2$ and $g(x) = \frac{x - 40}{3}$. Find $fg(31)$.	(a) $\frac{31 - 40}{3}$ 9	(1) (1)
(b)	Find the values of x when $f(x) = g^{-1}(x)$.	(b) $g^{-1}(x) = 3x + 40$ $x^2 = 3x + 40$ $(x - 8)(x + 5) = 0$ $x = 8, -5$	(1) (1) (1) (1)
2) (a)	Let $f(x) = 2x + 1$ and $g(x) = x^2 - 2$. Find $fg(x)$.	(a) $2(x^2 - 2) + 1$ $2x^2 - 3$	(1) (1)
(b)	Find when $fg(x) = gf(x)$.	(b) $gf(x) = (2x + 1)^2 - 2$ $2x^2 - 3 = 4x^2 + 4x - 1$ $2(x + 1)(x + 1) = 0$ $x = -1$	(1) (1) (1) (1)
3)	Let $f(x) = \frac{x + 5}{x + 3}$. Find $f^{-1}(x)$.	$x = \frac{y + 5}{y + 3}$ $x(y + 3) = y + 5$ $xy - y = 5 - 3x$ $y(x - 1) = 5 - 3x$ $f^{-1}(x) = \frac{5 - 3x}{x - 1}$	(1) (1) (1) (1)
4) (a)	Let $g(x) = 2x + 7$ and $h(x) = x(x + 3)$. Find an expression for $hg(x)$.	(a) $(2x + 7)(2x + 7 + 3)$ oe $4x^2 + 20x + 14x + 70$ $2x^2 + 17x + 35$	(1) (1) (1)
(b)	Find the values of x when $h(x) = g^{-1}(15)$.	(b) $g^{-1}(15) = 4$ $x(x + 3) = 4$ $(x + 4)(x - 1) = 0$ $x = -4$ and $x = 1$	(1) (1) (1) (1)

Where to go next?

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