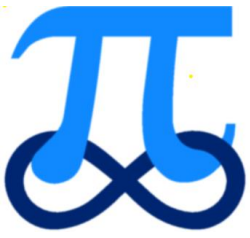
Kumarmaths

Pearson Edexcel

GCSE Maths 9 -1

Past Exam Questions by Topics.

Algebra: Functions



1. f is the function $f(x) = 2x + 5$.

(*a*) Find f(3).

.....

(1)

(*b*) Express the inverse function f^{-1} in the form $f^{-1}(x) =$

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

(2)

g is the function $g(x) = x^2 - 25$.

(*c*) Find g(–3).

.....

(1)

(*d*) (i) Find gf(*x*).
Give your answer as simply as possible.

$gf(x) =$ .....

(ii) Solve $gf(x) = 0$.

.....

(5)

(Total 9 marks)

2. $g(x) = \dfrac{4x}{3-x}$ $\quad\quad$ $f(x) = 2x - 5$

Given that $x > 3$, find the exact value of x such that $g^{-1}(x) = f(x)$.

(5 marks)

3. f is the function $f(x) = 2x + 5$.

(*a*) Find f(3).

.....

(1)

(*b*) Express the inverse function f^{-1} in the form $f^{-1}(x) =$

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

(2)

g is the function $g(x) = x^2 - 25$.

(*c*) Find g(–3).

.....

(1)

(*d*) (i) Find gf(*x*).
Give your answer as simply as possible.

$gf(x) =$ .....

(ii) Solve $gf(x) = 0$.

.....

(5)

(9 marks)

4. f is a function such that

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

(*a*) Find $f(\frac{1}{2})$

.....

(1)

g is a function such that

$g(x) = \sqrt{x-1} \quad x \geq 1$

(*b*) Find $fg(x)$
Give your answer as simply as possible.

$fg(x)$ = ...

(2)

(3 marks)

5. The function f is defined as

$$f(x) = \frac{x-6}{2}$$

(*a*) Find f(8).

.....

(1)

(*b*) Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$

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

(2)

The function g is defined as

$$g(x) = \sqrt{x-4}$$

(*c*) Express the function gf in the form gf(*x*) = …
Give your answer as simply as possible.

gf(*x*) = ...

(2)

(5 marks)

6. $f(x) = \frac{4}{x - 3}$ $g(x) = \frac{x - 2}{x}$

(*a*) Express the inverse function f^{-1} in the form $f^{-1}(x)$ = ...

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

(3)

(*b*) Solve fg(*a*) = 1

You must show your working.

a = ...

(3)

(6 marks)

7. For all values of x

$$f(x) = (x + 1)^2 \quad \text{and} \quad g(x) = 2(x - 1)$$

(*a*) Show that $gf(x) = 2x(x + 2)$

(2)

(*b*) Find $g^{-1}(7)$

.....

(2)

(4 marks)

8. $f(x) = 4\sin x°$

(*a*) Find f(23)
Give your answer correct to 3 significant figures.

.....

(1)

$g(x) = 2x - 3$

(*b*) Find fg(34)
Give your answer correct to 3 significant figures.

.....

(2)

$h(x) = (x + 4)^2$

Ivan needs to solve the following equation $h(x) = 25$

He writes

$(x + 4)^2 = 25$
$x + 4 = 5$
$x = 1$

This is not fully correct.

(*c*) Explain why.

.....

.....

(1)

(4 marks)

9. f and g are functions such that

$$f(x) = \frac{2}{x^2} \quad \text{and} \quad g(x) = 4x^3$$

(*a*) Find $f(-5)$

.....

(1)

(*b*) Find $fg(1)$

.....

(2)

(3 marks)

10. The function f and g are such that

$f(x) = 5x + 3$ $g(x) = ax + b$ where a and b are constants.

$g(3) = 20$ and $f^{-1}(33) = g(1)$

Find the value of a and the value of b.

a = ...

b = ...

(5 marks)

11. Two functions, f and g are defined as

$$f : x \mapsto 1 + \frac{1}{x} \qquad \text{for } x > 0$$

$$g : x \mapsto \frac{x+1}{2} \qquad \text{for } x > 0$$

Given that h = fg

express the inverse function h^{-1} in the form $h^{-1} : x \mapsto \ldots$

$h^{-1} : x \mapsto$ .....

(4 marks)

12. The function f is such that

$$f(x) = \frac{3x-5}{4}$$

(*a*) Find f (–7)

.....

(1)

(*b*) Express the inverse function f^{-1} in the form $f^{-1}(x) = ...$

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

(2)

The function g is such that

$$g(x) = \sqrt{19 - x}$$

(*c*) Find fg (3)

.....

(2)

(*d*) Which values of *x* cannot be included in any domain of g?

.....

(2)

(7 marks)

13. f is the function such that $f(x) = \sqrt{4 - x}$ and $f(x) \geqslant 0$

(*a*) State which values of *x* must be excluded from any domain of f

.....

(1)

The inverse function f^{-1} has domain $x \geqslant 0$

(*b*) Find $f^{-1}(x)$

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

(2)

g is the function such that $g(x) = (5 - x)(x - 1)$
The composite function fg has domain $x \geqslant 3$

(*c*) Find fg(*x*)
Give your answer in its simplest form.

$fg(x) =$ .....

(4)

(7 marks)

14. f is the function such that $f(x) = 3 - 2x$

(*a*) Find f (–4)

.....

(1)

(*b*) Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$

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

(2)

g is the function such that $g(x) = x^2 - 5$

(*c*) Solve the equation $gf(x) = ff(x)$
Show clear algebraic working.

.....

(5)

(8 marks)