

Functions Questions

Q1.

f and g are functions such that

$$f(x) = 3x^3 \quad \text{and} \quad g(x) = \frac{1}{x-2}$$

Find $gf(4)$.

Give your answer as a fraction.

.....

(Total for question = 2 marks)

Q2.

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)

(Total for question = 3 marks)

Q3.

The function f is such that

$$f(x) = 4x - 1$$

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

$$f^{-1}(x) = \dots\dots\dots$$

(2)

The function g is such that

$$g(x) = kx^2 \text{ where } k \text{ is a constant.}$$

Given that $fg(2) = 12$

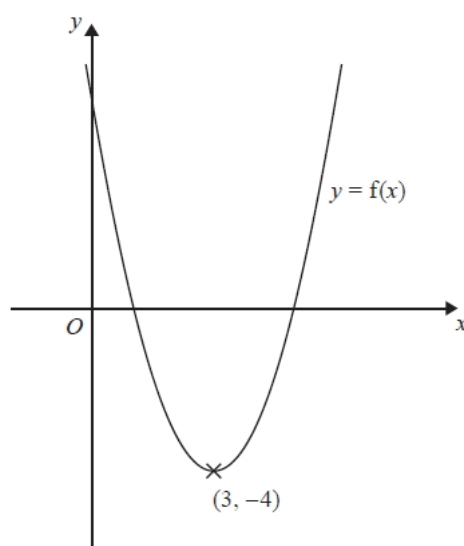
(b) work out the value of k

$$k = \dots\dots\dots$$

(2)

(Total for question = 4 marks)

Q4.



The diagram shows part of the curve with equation $y = f(x)$.

The coordinates of the minimum point of this curve are (3, -4)

Write down the coordinates of the minimum point of the curve with equation

(i) $y = f(x) + 3$

(..... ,)

(ii) $y = f(2x)$

(..... ,)

(iii) $y = f(-x)$

(..... ,)

(Total for Question is 3 marks)

Q5.

For all values of x

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

(a) Find $g(-4)$

.....
(1)

(b) Show that $gf(x) = 4x^2 - 12x + 11$

(2)

(c) Solve $fg(x) = gf(x)$

.....
(4)

(Total for question = 7 marks)

Q6.

$f(x) = \frac{1}{x+2} + \frac{1}{x-3}$

- (a) Work out $f(5)$
Give your answer as a fraction.

.....
(2)

- (b) Write down a value of x for which $f(x)$ is not defined.

.....
(1)

Given that $f(x) = 4$

- (c) find the possible values of x .

Give your answer in the form $\frac{p \pm \sqrt{q}}{r}$ where p, q and r are positive integers.

.....
(5)

(Total for question = 8 marks)

Q7.

$f(x) = x^3$
 $g(x) = 4x - 1$

- (a) Find $fg(2)$

.....
(2)

$$h(x) = fg(x)$$

(b) Find an expression for $h^{-1}(x)$

$$h^{-1}(x) = \dots\dots\dots$$

(3)

(Total for question = 5 marks)

Q8.

The functions f and g are such that

$$f(x) = 5x + 3$$

$$g(x) = ax + b$$

where a and b are constants.

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

Find the value of a and the value of b .

$$a = \dots\dots\dots$$

$$b = \dots\dots\dots$$

(Total for question = 5 marks)

Q9.

The functions f and g are such that

$$f(x) = 3(x - 4) \text{ and } g(x) = \frac{x}{5} + 1$$

(a) Find the value of $f(10)$

.....
(1)

(b) Find $g^{-1}(x)$

$g^{-1}(x) =$
(2)

(c) Show that $ff(x) = 9x - 48$

(2)

(Total for question = 5 marks)

Q10.

$$f(x) = 3x^2 - 2x - 8$$

Express $f(x + 2)$ in the form $ax^2 + bx$

.....

(Total for question is 3 marks)