

3.4 Homework

GCSE Mathematics Functions I

Marks Available : 28

Question 1

$$\text{Let } f(x) = \frac{x^3}{x^2 + 6x}, \quad x \in \mathbb{R}, \quad x \neq 0, \quad x \neq -6$$

$$\text{Find; (i) } f(2) \qquad \qquad \qquad \text{(ii) } f(-1)$$

[4 marks]

Question 2

$$\text{Let } g(x) = \sqrt{x^2 + 5x}, \quad x \in \mathbb{R}, \quad x \leq -5 \text{ or } x \geq 0$$

$$\text{Find; (i) } g(4) \qquad \qquad \qquad \text{(ii) } g(-9)$$

[4 marks]

Question 3

Let two functions f and g be;

$$f(x) = \frac{16}{x}, \quad x \in \mathbb{R}, \quad x \neq 0$$

$$\text{and } g(x) = x + 2, \quad x \in \mathbb{R}$$

Remember : $gf(16)$ means put 16 into function f first, then into function g .

Find;

$$\text{(i) } gf(16) \qquad \text{(ii) } fg(2) \qquad \text{(iii) } ggf(2)$$

$$\text{(iv) } ffg(14) \qquad \text{(v) } gfg(0) \qquad \text{(vi) } fgf(8)$$

[6 marks]

Question 4

Let two functions, e and z , be;

$$e(x) = (x + 3)^2, \quad x \in \mathbb{R}$$

$$\text{and } z(x) = 7x - 4, \quad x \in \mathbb{R}$$

Find each of the following;

(i) $e(-5)$ (ii) $e z(2)$ (iii) $z z(-1)$

(iv) $z e e(-2)$ (v) $z z(x)$ (vi) $e z(x)$

[6 marks]

Question 5

Let two functions, f and g be,

$$f(x) = x^2, \quad x \in \mathbb{R}$$

$$\text{and } g(x) = 50 - x, \quad x \in \mathbb{R}$$

Work out;

(i) $f(-5)$ (ii) $g(-5)$ (iii) $f g(10)$

(iv) $g f(10)$ (v) $f f f(2)$ (vi) $g g g g(7)$

(vii) Find $f g(x)$ and write your answer without brackets.

(viii) By trial and improvement find a value of x such that $f(x) = g(x)$

[8 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk