



## FUNCTIONS

**Question 1**

$$f(x) = \frac{6x+2}{5}$$

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

$$f^{-1}(x) = \dots\dots\dots (2)$$

For all values of  $x$

$$g(x) = (x-2)^2 \text{ and } h(x) = 2-3x$$

(b) Work out the value of  $gh(3)$

$$gh(3) = \dots\dots\dots$$

**Question 2**

The functions  $f$  and  $g$  are given by

$$f(x) = \frac{18}{x-2} \quad \text{and} \quad g(x) = 6 - 2x$$

(a) Find  $f(-4)$

.....  
(1)

(b) Find  $fg(-1)$

.....  
(2)

(c) Find  $g^{-1}(10)$

.....  
(2)

**Question 3**

For  $x \geq 0$ , the functions  $f$  and  $g$  are such that

$$f(x) = 2x - 6 \qquad g(x) = \frac{2\sqrt{x}}{3} + 7$$

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

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

(b) Solve  $gf(x) = 15$

$$x = \dots\dots\dots (3)$$

**Question 4**

$$f(x) = \sqrt{\frac{x}{2}}$$

$$g(x) = 4x - 5$$

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

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

**(3)**

### Question 5

The functions  $f$  and  $g$  are such that

$$f(x) = 2x^2 + 1 \text{ for } x > 0 \quad \text{and} \quad g(x) = \frac{9}{x} \text{ for } x > 0$$

(a) Work out  $gf(2)$

.....  
(2)

The function  $h$  is such that  $h = (fg)^{-1}$

(b) Find  $h(x)$

.....  
(4)

### QUESTION 6

$f$  and  $g$  are functions such that

$$f(x) = \frac{1}{3\sqrt{x}} \quad \text{and} \quad g(x) = 2(3x - 5)$$

(a) Find  $g(7)$

.....  
(1)

(b) Find  $gf(4)$

(c) Find  $g^{-1}(8)$

.....  
(2)

.....  
(2)

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### Question 7

The function  $f$  is given by

$$f(x) = 3x^2 + 5$$

(a) Show that  $f^{-1}(32) = 3$

(2)

The functions  $g$  and  $h$  are given by

$$g(x) = x + 3 \text{ and } h(x) = x^2$$

Find the values of  $x$  for which

$$hg(x) = 4x^2 + 8x + 1$$

(4)

