Name:_____

GCSE (1 - 9) Inverse and Composite Functions	Solutions:

These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***November 2021*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
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Question	Where the question appeared
1	Edexcel, GCSE, Autumn 2021, Paper 1H, Q21
2	Edexcel, GCSE, Autumn 2020, Paper 1H, Q19
3	Edexcel, GCSE, Autumn 2019, Paper 1H, Q18
4	Edexcel, GCSE, Summer 2019, Paper 1H, Q21
5	Edexcel, GCSE, Autumn 2018, Paper 1H, Q19
6	Edexcel, GCSE, Autumn 2018, Paper 3H, Q10
7	Edexcel, GCSE, Summer 2018, Paper 2H, Q11
8	Edexcel, GCSE, Autumn 2017, Paper 2H, Q22

1

The functions f and g are such that

$$f(x) = 3x^2 + 1 \quad \text{for } x > 0 \qquad \text{and} \qquad g(x) = \frac{4}{x^2} \quad \text{for } x > 0$$

(a) Work out gf(1)

.....

(2)

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

(b) Find $h(x)$

.....

(4)

(Total for Question 21 is 6 marks)

[Edexcel, GCSE, Autumn 2021, Paper 1H, Q21]

2

f and g are functions such that

$$f(x) = \frac{12}{\sqrt{x}} \quad \text{and} \quad g(x) = 3(2x + 1)$$

(a) Find g(5)

.....

(1)

(b) Find gf(9)

.....

(2)

(c) Find $g^{-1}(6)$

.....

(2)

(Total for Question 19 is 5 marks)

[Edexcel, GCSE, Autumn 2020, Paper 1H, Q19]

3

The function f is given by

$$f(x) = 2x^3 - 4$$

(a) Show that $f^{-1}(50) = 3$

(2)

The functions g and h are given by

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

(b) Find the values of x for which

$$hg(x) = 3x^2 + x - 1$$

.....

(4)

(Total for Question 18 is 6 marks)

[Edexcel, GCSE, Autumn 2019, Paper 1H, Q18]

4

The functions f and g are such that

$$f(x) = 3x - 1 \quad \text{and} \quad g(x) = x^2 + 4$$

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

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

(2)

Given that $fg(x) = 2gf(x)$,

(b) show that $15x^2 - 12x - 1 = 0$

(5)

(Total for Question 21 is 7 marks)

[Edexcel, GCSE, Summer 2019, Paper 1H, Q21]

5

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)

(Total for Question 19 is 4 marks)

[Edexcel, GCSE, Autumn 2018, Paper 1H, Q19]

6

$f(x) = 4\sin x°$

(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)

(Total for Question 10 is 4 marks)

[Edexcel, GCSE, Autumn 2018, Paper 3H, Q10]

7

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 11 is 3 marks)

[Edexcel, GCSE, Summer 2018, Paper 2H, Q11]

8

The functions f and g are such that

$$f(x) = 5x + 3 \qquad g(x) = ax + b \qquad \text{where } a \text{ and } b \text{ are constants.}$$

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

Find the value of a and the value of b.

$a =$ .....

$b =$ .....

(Total for Question 22 is 5 marks)

[Edexcel, GCSE, Autumn 2017, Paper 2H, Q22]