

Composite Functions

For Pearson Edexcel GCSE Mathematics (1MA1) • Higher tier

Name _____

Total marks: **27**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

1 $f(x) = \frac{x+7}{2}$ and $g(x) = x^2 + 2$

(a) Find $f(9)$

.....
(1)

(b) Find $fg(3)$

.....
(2)

(Total for Question 1 is 3 marks)

2 $f(x) = x^2 - 2$ $g(x) = 2x + 1$

(a) Find $fg(3)$

.....
(2)

(b) Show that $gf(x) = 2x^2 - 3$

(2)

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

.....
(4)

(Total for Question 2 is 8 marks)

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

Find $fg(x)$ and simplify your answer.

.....
(2)

(Total for Question 3 is 2 marks)

4 $f(x) = 2x - 1$

(a) Find $ff(x)$

.....
(2)

(b) Solve $ff(x) = x$

.....
(2)

(Total for Question 4 is 4 marks)

5 $f(x) = x^2 + k$ where k is a constant.

$g(x) = 3x - 1$

Given that $gf(3) = 44$

work out the value of k .

$k =$
(2)

(Total for Question 5 is 2 marks)

- 6** The functions f and g are such that
 $f(x) = x^2$ and $g(x) = x + 3$
 Solve $fg(x) = 4f(x)$

.....
 (4)

(Total for Question 6 is 4 marks)

- 7** $g(x) = x^2$ $h(x) = x + k$ where k is a constant.
 Given that $gh(x) - hg(x) = 6x + 6$ for all values of x ,
 work out the value of k .
 You must show all your working.

$k =$
 (4)

(Total for Question 7 is 4 marks)
