1 $f(x) = 3x + 4$ $g(x) = x + 10$ $h(x) = x^2$

(a) Work out fg(x)
Give your answer in the form $ax + b$ where a and b are integers

fg(x) = ...

(2)

(b) Work out gf(x)
Give your answer in the form $ax + b$ where a and b are integers

gf(x) = ...

(2)

(a) Work out gh(x)

gh(x) = ...

(1)

(Total for Question 1 is 5 marks)

1

2 $f(x) = x - 3$ $\qquad$ $g(x) = x^2 + 1$ $\qquad$ $h(x) = 10x$

(a) Work out fg(x)
Fully simplify your answer.

fg(x) = ...
(2)

(b) Work out hg(x)
Fully simplify your answer.

hg(x) = ...
(2)

(c) Work out gh(x)
Fully simplify your answer.

gh(x) = ...
(2)

(Total for Question 2 is 6 marks)

3 $f(x) = \dfrac{x}{4}$ $g(x) = 4x - 8$ $h(x) = \sqrt{x}$

(a) Work out fg(x)
     Fully simplify your answer.

fg(x) = ...
(2)

(b) Work out gf(x)
     Fully simplify your answer.

gf(x) = ...
(2)

(c) Work out hf(x)
     Fully simplify your answer.

hf(x) = ...
(2)

(Total for Question 3 is 6 marks)

3

4 $f(x) = x - 5$ $g(x) = x^2 + 30$

(a) Work out $fg(x)$
    Fully simplify your answer.

$fg(x) =$ ....

(2)

(b) Work out $fg(3)$

....

(2)

(c) Work out $gf(x)$
    Give your answer in the form $ax^2 + bx + c$ where a, b and c are integers.

$gf(x) =$ ....

(3)

(Total for Question 4 is 7 marks)

4

5   f(x) = 2x + 1   g(x) = $\sqrt{x + 3}$

(a) Work out g(13)

....
(1)

(b) Work out fg(13)

....
(1)

(c) Work out gf(16)

....
(2)

(Total for Question 5 is 4 marks)

5

6 $f(x) = x + 2$ $\qquad$ $g(x) = x^3$ $\qquad$ $h(x) = \sqrt{x}$

(a) Work out gf(3)

....
(2)

(b) Work out gh(x)

Give your answer in the form x^k where k is a fraction.

gh(x) = ...
(2)

(c) Work out gf(x)

Give your answer in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are integers.

gf(x) = ...
(3)

(Total for Question 6 is 7 marks)

6

7 $f(x) = 2^x$ $g(x) = 1 - x$ $h(x) = 2 + x$

(a) Work out gf(-3)

....

(2)

$hg(x) - gh(x) = k$ where k is an integer.

(b) Find the value of k.

$k = $ ....

(4)

(c) Show that $\dfrac{fh(x)}{fg(x)} = 2^{ax+b}$ where a and b are integers.

(3)

(Total for Question 7 is 9 marks)

7