



Topical Worksheets for Cambridge O LEVEL Mathematics D (4024)

Functions

1st edition, for examination until 2025

1 $h(x) = \frac{5x-1}{3}$

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

$h^{-1}(x) = \dots\dots\dots$ [3]

[Total: 3]

2 $f(x) = 3x - 5$ $g(x) = 2^x$

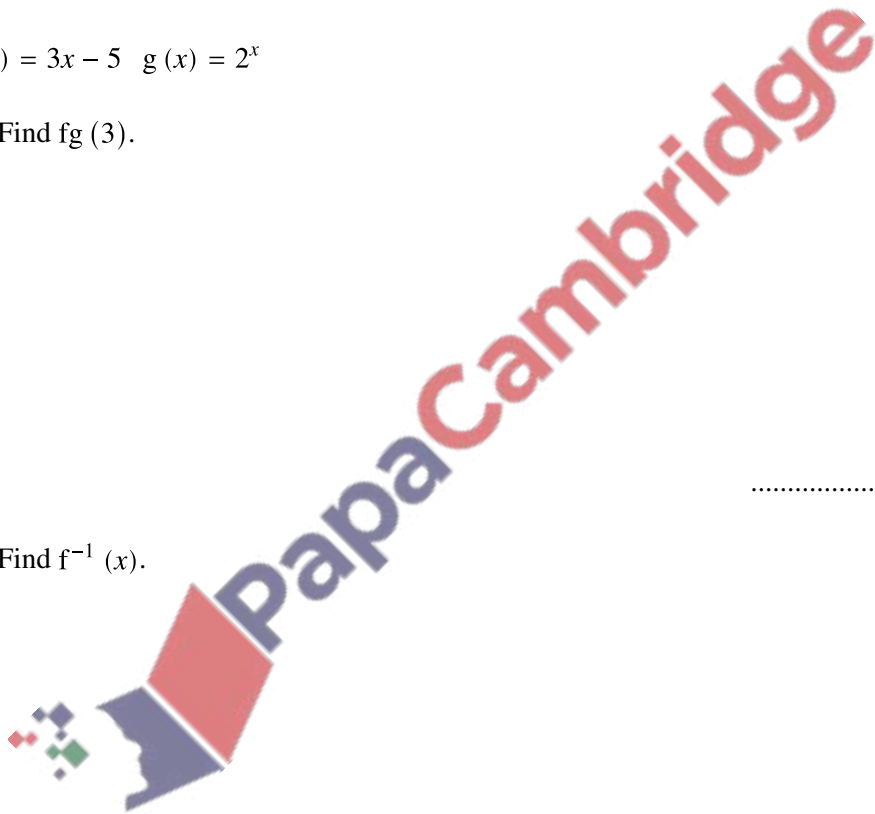
(a) Find $fg(3)$.

$\dots\dots\dots$ [2]

(b) Find $f^{-1}(x)$.

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

[Total: 4]



3 $f(x) = 4x + 3$ $g(x) = 5x - 4$

$fg(x) = 20x + p$

Find the value of p .

$p = \dots\dots\dots$ [2]

[Total: 2]

4 $f(x) = 2x + 3$

Find $f(1 - x)$ in its simplest form.

$\dots\dots\dots$ [2]

[Total: 2]

5 $f(x) = 7x - 2$ $g(x) = x^2 + 1$ $h(x) = 3^x$

(a) Find $gh(2)$.



$\dots\dots\dots$ [2]

(b) Find $f^{-1}(x)$.

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

(c) $gg(x) = ax^4 + bx^2 + c$

Find the values of a , b and c .

$$a = \dots\dots\dots$$

$$b = \dots\dots\dots$$

$$c = \dots\dots\dots \quad [3]$$

(d) Find x when $hf(x) = 81$.

$$x = \dots\dots\dots \quad [3]$$

[Total: 10]

6 $f(x) = \frac{3}{x+2}, x \neq -2$ $g(x) = 8x - 5$ $h(x) = x^2 + 6$

(a) Work out $g\left(\frac{1}{4}\right)$.

$$\dots\dots\dots \quad [1]$$

(b) Work out $ff(2)$.

..... [2]

(c) Find $gg(x)$, giving your answer in its simplest form.

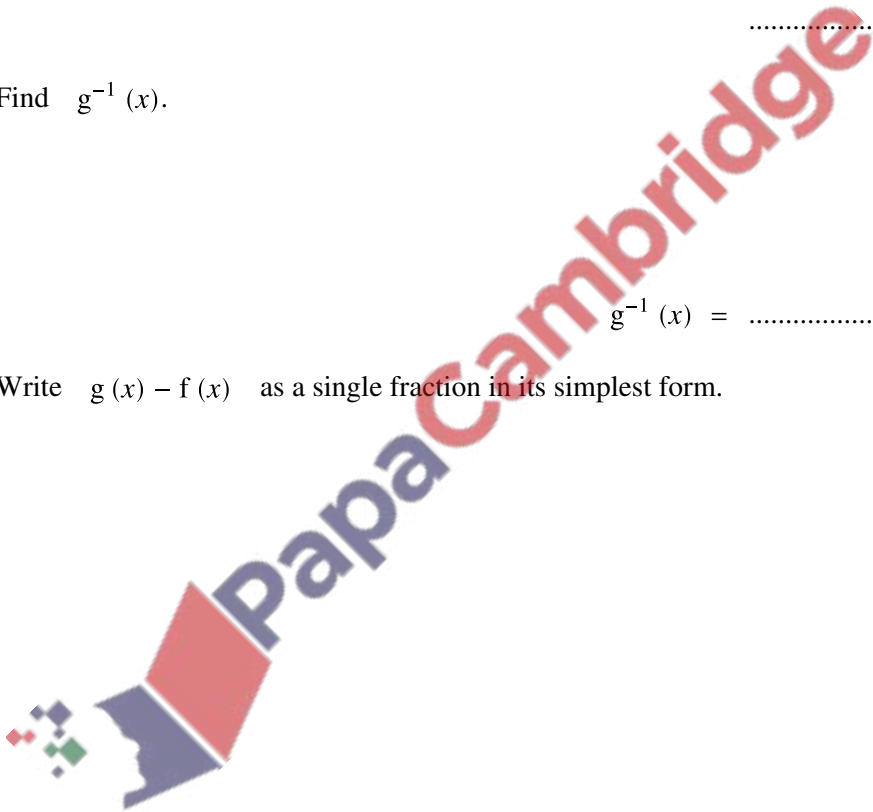
..... [2]

(d) Find $g^{-1}(x)$.

$g^{-1}(x) =$ [2]

(e) Write $g(x) - f(x)$ as a single fraction in its simplest form.

..... [3]



- (f) (i) Show that $hg(x) = 19$ simplifies to $16x^2 - 20x + 3 = 0$.

[3]

- (ii) Use the quadratic formula to solve $16x^2 - 20x + 3 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots \quad [4]$$

[Total: 17]

7

(a) $h(3x) = k^x$

Find the value of k .

$$f(x) = 7 + 3x \quad g(x) = x^4 \quad h(x) = 3^x$$

$$k = \dots\dots\dots \quad [2]$$

(b) Find the value of x when $f(x) = g(2)$.

$$x = \dots\dots\dots [2]$$

(c) Find $f^{-1}(x)$.

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

[Total: 6]

8 $h(x) = ax^2 + 1$

Find the value of a when $h(-2) = 21$.

$$a = \dots\dots\dots [2]$$

[Total: 2]

9 $f(x) = x^3$ $g(x) = 5x + 2$

(a) Find $gf(x)$.

$$\dots\dots\dots [1]$$

(b) Find $g^{-1}(x)$.

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

[Total: 3]

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

(a) Find $g\left(\frac{1}{2}\right)$.

$$\dots\dots\dots [1]$$

(b) Find $fh(-1)$.

$$\dots\dots\dots [2]$$

(c) Find $g^{-1}(x)$.

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

(d) Find $ff(x)$ in its simplest form.

$$\dots\dots\dots [2]$$

(e) Find $(f(x))^2$ in the form $ax^2 + bx + c$.

..... [2]

(f) Find x when $h^{-1}(x) = g(2)$.

$x =$ [2]

[Total: 11]

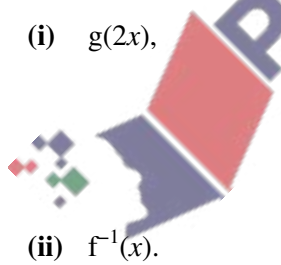
11 $f(x) = 5 - 2x$ $g(x) = x^2 + 8$

(a) Calculate $ff(-3)$.

..... [2]

(b) Find

(i) $g(2x)$,



..... [1]

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

$f^{-1}(x) =$ [2]

[Total: 5]

12 $f(x) = 2x - 3$ $g(x) = x^2 + 1$

(a) Find $gg(2)$.

..... [2]

(b) Find $g(x+2)$, giving your answer in its simplest form.

..... [2]

(c) Find x when $f(x) = 7$.

$x =$ [2]

(d) Find $f^{-1}(x)$.

$f^{-1}(x) =$ [2]

[Total: 8]

13 $f(x) = 8 - 3x$ $g(x) = \frac{10}{x-1}$, $x \neq -1$ $h(x) = 2^x$

Find

(a) $hf\left(\frac{8}{3}\right)$,

..... [2]

(b) $gh(-2)$,

..... [2]

(c) $g^{-1}(x)$,

$g^{-1}(x) =$ [3]

(d) $f^{-1}f(5)$.

..... [1]

[Total: 8]

14 $f(x) = 7 - x$ $g(x) = 4x + 2$ $h(x) = 15 - x^2$

(a) Find $ff(2)$.

..... [2]

(b) Find $gf(x)$ in its simplest form.

..... [2]

(c) Find $h(2x)$ in its simplest form.

..... [2]

[Total: 6]

15 $h(x) = x^x, x > 0$

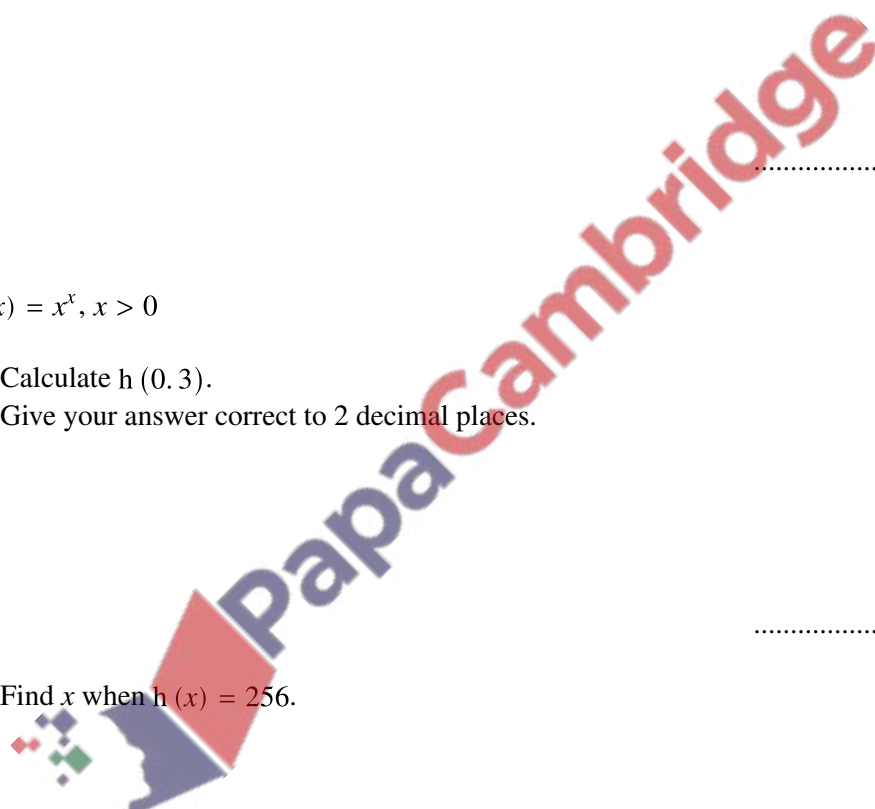
(a) Calculate $h(0.3)$.
Give your answer correct to 2 decimal places.

..... [2]

(b) Find x when $h(x) = 256$.

$x =$ [1]

[Total: 3]



16 $f(x) = 3x + 5$ $g(x) = x^2$

(a) Find $g(3x)$.

Answer(a) [1]

(b) Find $f^{-1}(x)$, the inverse function.

Answer(b) $f^{-1}(x) =$ [2]

(c) Find $ff(x)$.
Give your answer in its simplest form.

Answer(c) [2]

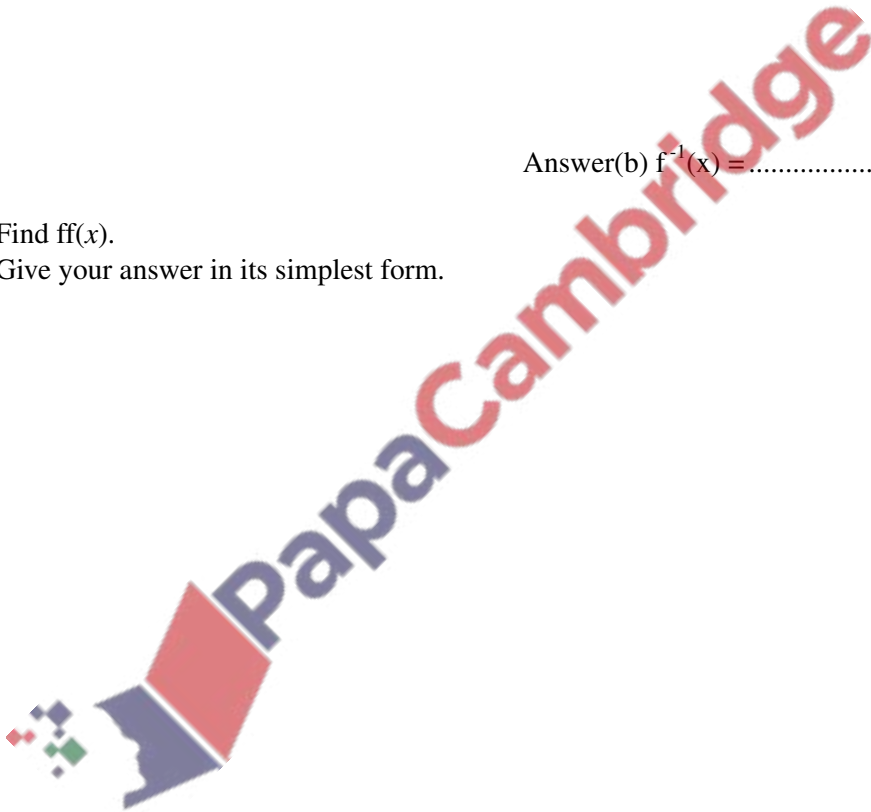
[Total: 5]

17

$$f(x) = 5 - 3x$$

(a) Find $f(6)$.

Answer(a) [1]



(b) Find $f(x + 2)$.

Answer(b) [1]

(c) Find $ff(x)$, in its simplest form.

Answer(c) [2]

(d) Find $f^{-1}(x)$, the inverse of $f(x)$

Answer(d) $f^{-1}(x) =$ [2]

[Total: 6]

