11 $f(x) = \frac{1}{2x-5}$, $x \neq 2.5$

(a) Find $f(2)$.

..... [1]

(b) Solve $f(x) = 5$.

..... [2]

14 $f(x) = 5x + 2$

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

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

14 $f(x) = x^{\frac{1}{7}}$

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

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

25 $f(x) = x^3 + 1$

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

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

8 **(a)** $f(x) = 3 - 5x$

(i) Find x when $f(x) = -5$.

$x =$ ..... [2]

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

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

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

The domain of $f(x)$ is $\{-3, 0, 2\}$.

Find the range of $f(x)$.

{ ..... } [2]

17 **(a)** $f(x) = 3x^2 + a$ where a is an integer.
$f(-2) = 19$

Find the value of a.

$a =$ ..... [2]

(b) $g(x) = 2x + 7$ $h(x) = 3x - 8$

(i) Find $gh(x)$ in its simplest form.

..... [2]

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

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

12 $f(x) = 11x + 2$ $g(x) = \sin x°$

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

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

(b) Find $g(f(8))$.

..... [2]

19 $f(x) = 7x - 8$ $g(x) = \frac{4}{x} + 5$ $h(x) = 2^x + 1$

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

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

(b) Find the value of x when $h(x) = g\left(\frac{1}{3}\right)$.

$x =$ ..... [2]

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

$fg(x) = 20x + p$

Find the value of p.

$p =$ ..... [2]

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

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

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

18 $f(x) = 3 - 2x$ $g(x) = 2x + 3$ $h(x) = 2^x$

(a) (i) Find $f(-3)$.

..... [1]

(ii) Find $gf(-3)$.

..... [1]

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

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

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

$x =$ ..... [3]

(d) Find x when $h^{-1}(x) = 5$.

$x =$ ..... [2]

14 $f(x) = 3x - 4$ $g(x) = 4x + 1$

(a) Find $f(-2)$.

..... [1]

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

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

(c) $fg(x) = ax + b$

Find the value of a, and the value of b.

$a =$ ..... $b =$ ..... [2]

(d) Simplify.

$$\frac{2}{f(x)} - \frac{5}{g(x)}$$

Give your answer as a single fraction in terms of x.

..... [3]

19 $f(x) = x + 1$ $g(x) = 5 - 2x$ $h(x) = 2^x$

(a) Find $f(-3)$.

..... [1]

(b) The domain of $g(x)$ is $\{-3, 0, 2\}$.

Find the range of $g(x)$.

{ ..... } [2]

(c) Find x when $h(x) = \frac{1}{32}$.

$x =$ ..... [1]

(d) Find x when $h^{-1}(x) = 3$.

$x =$ ..... [2]

14 $f(x) = 5 - 4x$

(a) Find $f(-3)$.

..... [1]

(b) Find $f(3 - 2x)$.
Give your answer in its simplest form.

..... [2]

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

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

20 $f(x) = 6x - 7$ $g(x) = x^{-3}$

(a) Find $f(x+2)$.
Give your answer in its simplest form.

..... [2]

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

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

(c) Find x when $g(x) = f(22)$.

$x =$ ..... [2]

19 $f(x) = kx^2$ $g(x) = \frac{1}{x}$ $h(x) = \frac{7x-2}{5}$ $j(x) = \frac{3-10x}{14}$

(a) $f(-5k) = 675$

Find the value of k.

$k =$ ..... [2]

(b) Find $gh(x)$.

..... [1]

(c) Find $h^{-1}(x) + j(x)$.
Give your answer in its simplest form.

..... [4]

6 $f(x) = 3x+2$ $g(x) = x^2+1$ $h(x) = 4^x$

(a) Find h(4).

..... [1]

(b) Find fg(1).

..... [2]

(c) Find gf(x) in the form ax^2+bx+c.

..... [3]

(d) Find x when $f(x) = g(7)$.

$x =$ ..... [2]

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

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

(f) Find $\frac{g(x)}{f(x)} + x$.

(continued from previous page)

Give your answer as a single fraction, in terms of x, in its simplest form.

..... [3]

18 $f(x) = x^2 - 25$ $g(x) = x + 4$

Solve $fg(x+1) = gf(x)$.

$x =$ ..... [4]

11 $f(x) = \frac{1}{x}, x \neq 0$ $g(x) = 3x - 5$ $h(x) = 2^x$

(a) Find.

(i) $gf(2)$

..... [2]

(ii) $g^{-1}(x)$

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

(b) Find in its simplest form $g(x-2)$.

..... [2]

(c) Find the value of x when

(i) $fg(x) = 0.1$

$x =$ ..... [2]

(ii) $h(x) - g(7) = 0$.

$x =$ ..... [2]

11 $f(x) = 7x - 4$ $g(x) = \frac{2x}{x-3}$, $x \neq 3$ $h(x) = x^2$

(a) Find $g(6)$.

..... [1]

(b) Find $fg(4)$.

..... [2]

(c) Find $fh(x)$.

..... [1]

(d) Find $\frac{f(x)}{2} + g(x)$.

Give your answer as a single fraction, in terms of x, in its simplest form.

..... [3]

(e) Find the value of x when $f(x+2) = -11$.

(continued from previous page)

$x =$ ..... [2]

11 $f(x) = 2x - 1$ $g(x) = x^2 + 2x$ $h(x) = 4^x$

(a) Find the value of

(i) h(3),

..... [1]

(ii) fh(3).

..... [1]

(b) Solve the equation $gf(x) = 0$.

$x =$ ..... or $x =$ ..... [4]

(c) $p^{-1}(x) = f(x)$

Find $p(x)$.

..... [2]

6 $f(x) = 5x - 3$ $g(x) = 64^x$ $h(x) = \frac{2}{x+1}, \quad x \neq -1$

(a) Find the value of

(i) f(2)

..... [1]

(ii) gf(0.5).

..... [2]

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

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

(c) Find x when $g(x) = \frac{1}{2^5}$.

$x =$ ..... [2]

(d) Write as a single fraction in its simplest form $\frac{1}{f(x)} - h(x)$.

..... [4]

17 $f(x) = x^2$ $g(x) = \frac{x+5}{2}$ $h(x) = 7x - 3$

(a) Find $f(-3)$.

..... [1]

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

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

(c) Solve $gf(x) = hh^{-1}(63)$ where $x > 0$.

$x =$ ..... [3]

20 $f(x) = 2^{x-3}$ $g(x) = 2x-1$ $h(x) = \frac{5}{x-4}$

(a) Find ff(6).

..... [2]

(b) Find $g^{-1}g(x+21)$.

..... [1]

(c) Find x when $f(x) = h(84)$.

$x =$ ..... [2]

19 $f(x) = 5x - 3,\ x > 1$

$g(x) = \dfrac{10}{x-2},\ x \neq 2$

(a) Find $gf(x)$.
Give your answer in its simplest form.

..... [2]

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

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

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

..... [1]

22 $f(x) = 2x+5$ $g(x) = x-4$ $h(x) = 5^x$

(a) Find $f(3)$.

..... [1]

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

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

(c) Solve $fg(x) = 25$.

$x =$ ..... [3]

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

$x =$ ..... [2]

11 $f(x) = 1-3x$ $g(x) = (x-1)^2$ $h(x) = \frac{3}{x}, x \neq 0$

(a) Find g(3).

..... [1]

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

..... [2]

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

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

(d) $gf(x) - g(x)f(x) = 3x^3 + ax^2 + bx + c$

Find the value of each of a, b and c.

$a =$ .....

$b =$ .....

$c =$ ..... [5]

(f) $h(x^n) = 3x^7$

(continued from previous page)

Find the value of n.

$n =$ ..... [1]

10 $f(x) = x^2 + 1$ $g(x) = 1 - 2x$ $h(x) = \frac{1}{x}, \ x \neq 0$ $j(x) = 5^x$

(a) Find the value of

(i) f(3),

..... [1]

(ii) gf(3).

..... [1]

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

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

(c) Find x when $\mathrm{h}(x) = 2$.

(continued from previous page)

$x =$ ..... [1]

(d) Find $\mathrm{g}(x)\mathrm{g}(x) - \mathrm{gg}(x)$, giving your answer in the form $ax^2 + bx + c$.

..... [4]

(e) Find $\mathrm{hh}(x)$, giving your answer in its simplest form.

..... [1]

(f) Find $\mathrm{j}(5)$.

..... [1]

9 $f(x) = (3x+1)(x+5)(x-4)$ $g(x) = 2x-3$ $h(x) = 4^{2x-1}$

(a) Find

(i) $f(0)$

..... [1]

(ii) $g^{-1}(x)$

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

(iii) $gh(2)$.

..... [2]

(b) $g(2x) = 7$

Find the value of x.

$x =$ ..... [2]

(c) Simplify $g(x^2) + gg(x) + 1$.

..... [3]

7 $f(x) = 10 - x$ $g(x) = \frac{2}{x}, \ x \neq 0$ $h(x) = 2^x$ $j(x) = 5 - 2x$

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

..... [1]

(ii) Find $hg\left(\frac{1}{2}\right)$.

..... [1]

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

$x =$ ..... [1]

(c) Find x when $g(x) = h(3)$.

$x =$ ..... [2]

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

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

(e) Write $f(x) + g(x) + 1$ as a single fraction in its simplest form.

..... [3]

(f) $\left(\mathrm{f}(x)\right)^2 - \mathrm{ff}(x) = ax^2 + bx + c$

(continued from previous page)

Find the values of a, b and c.

$a =$ .....

$b =$ .....

c = ... [4]