June 2018 P1H

14 The function f is such that

$$f(x) = \frac{3x - 5}{4}$$

(a) Find f(−7)

$f(-7) = \frac{3(-7)-5}{4}$

$= -6.5$

(1)

(b) Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$

$y = \frac{3x-5}{4}$ ×4 ×4

$4y = 3x-5$ +5 +5

$4y+5 = 3x$ ÷3 ÷3

$\frac{4y+5}{3} = x$

$\frac{4x+5}{3} = f^{-1}(x)$

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

(2)

The function g is such that

$$g(x) = \sqrt{19 - x}$$

(c) Find fg(3)

$g(3) = \sqrt{19-(3)}$

$g(3) = 4$

$f(4) = \frac{3(4)-5}{4} = 1.75$

.....

(2)

(d) Which values of x cannot be included in any domain of g?

√negative is impossible

$x > 19$

.....

(2)

(Total for Question 14 is 7 marks)

June 2022 P1H

14 The function f is defined as

$$f: x \mapsto \frac{2x}{x - 6} \quad x \neq 6$$

(a) Find f(10)

$f(10) = \frac{2(10)}{(10)-6}$

$= 5$

.....

(1)

(b) Express the inverse function f^{-1} in the form $f^{-1}: x \mapsto \ldots$

$y = \frac{2x}{x-6}$ ×(x−6) ×(x−6)

$y(x-6) = 2x$

$yx - 6y = 2x$

+6y +6y

$yx = 2x + 6y$

−2x −2x

$yx - 2x = 6y$

$x(y-2) = 6y$

÷(y−2) ÷(y−2)

$x = \frac{6y}{y-2}$

$f^{-1}: x \mapsto$ .....

(3)

(Total for Question 14 is 4 marks)

$f^{-1}(x) = \frac{6x}{x-2}$

November 2021 P2H

15 The functions f and g are such that

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

$$g(x) = \frac{x}{3x+1}$$

(a) State the value of x that cannot be included in any domain of g

Cant divide by 0

$3x+1 = 0$

$3x = -1$

$x = \frac{-1}{3}$

.....

(1)

(b) Find $gf(x)$
Simplify your answer.

$gf(x) = \frac{(2x-3)}{3(2x-3)+1}$

$= \frac{2x-3}{6x-9+1}$

$= \frac{2x-3}{6x-8}$

$gf(x) =$ .....

(2)

(c) Express the inverse function g^{-1} in the form $g^{-1}(x) = ...$

$y = \frac{x}{3x+1}$

$\times 3x+1$ $\quad \times 3x+1$

$y(3x+1) = x$

$3xy + y = x$

$y = x - 3xy$

$y = x(1-3y)$

$\frac{y}{1-3y} = x$

$\frac{x}{1-3x} = f^{-1}(x)$

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

(3)

(Total for Question 15 is 6 marks)

June 2024 P1H

15 The function f is defined as

$$f: x \mapsto \frac{3x+1}{x-2}$$

(a) State the value of x that cannot be included in any domain of the function f

Can not ÷ by 0

$x - 2 = 0$

$x = 2$

.....

(1)

(b) Express the inverse function f^{-1} in the form $f^{-1}(x) = ...$

$y = \frac{3x+1}{x-2}$

$y(x-2) = 3x+1$

$yx - 2y = 3x + 1$

$yx = 3x + 1 + 2y$

$yx - 3x = 1 + 2y$

$x(y-3) = 1 + 2y$

$x = \frac{1+2y}{y-3}$

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

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

(3)

(Total for Question 15 is 4 marks)

January 2023 Paper1HR

16 The function f is such that

$$f(x) = \frac{2}{3x-5} \quad \text{where } x \neq \frac{5}{3}$$

(a) Find $f\left(\frac{1}{3}\right)$

$f\left(\frac{1}{3}\right) = \frac{2}{3\left(\frac{1}{3}\right)-5}$

$= -0.5$

(1)

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

$y = \frac{2}{3x-5}$

$y(3x-5) = 2$

$3xy - 5y = 2$

$3xy = 2 + 5y$

$x = \frac{2+5y}{3y}$

$f^{-1}(x) = \frac{2+5x}{3x}$

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

(2)

The function g is such that

$$g(x) = 5x^2 - 20x + 23$$

(c) Express $g(x)$ in the form $a(x-b)^2 + c$

$g(x) = 5x^2 - 20x + 23$

$= 5\left[x^2 - 4x + \frac{23}{5}\right]$

$= 5\left[(x-2)^2 - 4 + \frac{23}{5}\right]$

$= 5\left[(x-2)^2 + 0.6\right]$

$= 5(x-2)^2 + 3$

.....

(3)

(Total for Question 16 is 6 marks)

November 2020 Paper 1HR

16 The functions f and g are defined as

$$f: x \mapsto 5x - 7$$

$$g: x \mapsto \frac{5x}{x+4}$$

(a) Write down the value of x that must be excluded from any domain of g

not divide by 0 $x+4 = 0$

$x = -4$

.....

(1)

(b) Find gf(2.6)

$f(2.6) = 5(2.6) - 7$

$= 6$

$g(6) = \frac{5(6)}{(6)+4} = 3$

.....

(2)

(c) Solve $fg(x) = 2$

$5\left(\frac{5x}{x+4}\right) - 7 = 2$

$5\left(\frac{5x}{x+4}\right) = 9$

$\frac{25x}{x+4} = 9$

$25x = 9(x+4)$

$25x = 9x + 36$

$16x = 36$

$x = \frac{36}{16}$

$x = 2.25$

$x =$ .....

(3)

(d) Express the inverse function g^{-1} in the form $g^{-1}: x \mapsto \ldots$

$y = \frac{5x}{x+4}$

$y(x+4) = 5x$

$yx + 4y = 5x$

$4y = 5x - yx$

$4y = x(5-y)$

$\frac{4y}{5-y} = x$ $\quad f^{-1}(x) = \frac{4x}{5-x}$

$g^{-1}: x \mapsto$ .....

(3)

(Total for Question 16 is 9 marks)

January 2020 Paper 1HR

17 The function f is such that $f(x) = (x - 4)^2$ for all values of x.

(a) Find f(1)

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

$= (-3)^2$

$= 9$

(1)

(b) State the range of the function f.

All squared values are positive

$f(x) > 0$

(1)

The function g is such that $g(x) = \frac{4}{x + 3}$ $x \neq -3$

(c) Work out fg(2)

$g(2) = \frac{4}{(2) + 3}$

$= 0.8$

$f(0.8) = (0.8) - 4)^2$

$= 10.24$

(2)

(Total for Question 17 is 4 marks)

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January 2019 P2H

17 f is the function such that $f(x) = 4 - 3x$

(a) Work out f(5)

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

$= -11$

(1)

g is the function such that $g(x) = \frac{1}{1 - 2x}$

(b) Find the value of x that cannot be included in any domain of g

Can't divide by 0

$1 - 2x = 0$

$1 = 2x$

$\frac{1}{2} = x$

(1)

(c) Work out fg(−1.5)

$g(-1.5) = \frac{1}{1 - 2(-1.5)}$

$= 0.25$

$f(0.25) = 4 - 3(0.25)$

$= 3.25$

(2)

(Total for Question 17 is 4 marks)

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June 2023 P1H

17 The functions g and h are such that

$$g(x) = \frac{11}{2x - 5}$$

$$h(x) = x^2 + 4 \qquad x \geqslant 0$$

(a) What value of x must be excluded from any domain of g?

not divide by 0

$2x - 5 = 0$

$2x = 5$

$x = \frac{5}{2}$

..... (1)

(b) Solve $gh(x) = 1$

$\frac{11}{2(x^2+4) - 5} = 1$

$\frac{11}{2x^2 + 8 - 5} = 1$

$\frac{11}{2x^2 + 3} = 1$

$11 = 2x^2 + 3$

$8 = 2x^2$

$4 = x^2$

$\sqrt{4} = x$

$x = 2$

..... (3)

(Total for Question 17 is 4 marks)

January 2021 Paper 2HR

17 The functions f and g are defined as

$f(x) = x^2 + 6$

$g(x) = x - 10$

(a) Find fg(3)

$g(3) = (3) - 10$

$= -7$

$f(-7) = (-7)^2 + 6 = 55$

..... (2)

(b) Solve the equation $fg(x) = f(x)$

Show clear algebraic working.

$(x-10)^2 + 6 = x^2 + 6$

$x^2 - 10x - 10x + 100 + 6 = x^2 + 6$

$x^2 - 20x + 106 = x^2 + 6$

$x^2 - 20x + 100 = x^2$

$-20x + 100 = 0$

$100 = 20x$

$\frac{100}{20} = x$

$x = 5$

..... (3)

The function h is defined as

$h(x) = \frac{2x - 4}{x}$

(c) State the value of x that cannot be included in the domain of h

$x = 0$

..... (1)

(d) Express the inverse function h^{-1} in the form $h^{-1}(x) = \ldots$

$y = \frac{2x - 4}{x}$

$yx = 2x - 4$

$yx - 2x = -4$

$x(y - 2) = -4$

$x = \frac{-4}{y - 2}$

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

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

(Total for Question 17 is 9 marks)

June 2024 P2HR

17 $f(x) = \frac{x}{2x-4}$ $g(x) = 3x + 1$

Given that $fg(k) = 2$

work out the value of k

$g(k) = 3k+1$

$f\,g(k) = \frac{3k+1}{2(3k+1)-4}$

$f\,g(k) = \frac{3k+1}{6k+2-4}$

$f\,g(k) = \frac{3k+1}{6k-2}$

$2 = \frac{3k+1}{6k-2}$

$2(6k-2) = 3k+1$

$12k-4 = 3k+1$

$9k-4 = 1$

$9k = 5$

$k = \frac{5}{9}$

$k =$ .....

(Total for Question 17 is 3 marks)

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June 2019 Paper 2HR

18 The functions f and g are defined as

$$f(x) = \frac{x}{4x-3} \quad \text{and} \quad g(x) = x - 5$$

(a) State which value of x must be excluded from any domain of the function f.

$4x-3=0$

$4x=3$

$x=3/4$

..... **(1)**

(b) Find $fg(x)$.
Simplify your answer.

$\frac{(x-5)}{4(x-5)-3} = \frac{x-5}{4x-20-3}$

$= \frac{x-5}{4x-23}$

$fg(x) =$ ..... **(2)**

(c) Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$

$y = \frac{x}{4x-3}$

$y(4x-3) = x$

$4xy - 3y = x$

$4xy = x + 3y$

$4xy - x = 3y$

$x(4y-1) = 3y$

$x = \frac{3y}{4y-1}$

$f^{-1}(x) = \frac{3x}{4x-1}$

$f^{-1}(x) =$ ..... **(3)**

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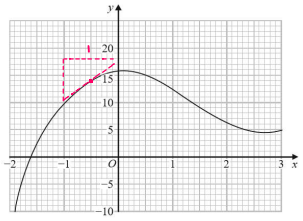
June 2019 Paper 2HR

Part of the curve with equation $y = h(x)$ is shown on the grid.



(d) Find an estimate for the gradient of the curve at the point where $x = -0.5$
Show your working clearly.

$\frac{-8}{1} = -8$

(3)

(Total for Question 18 is 9 marks)

January 2023 P1H

18 The function f is such that $f(x) = \frac{k}{x}$ where $x \neq 0$ and k is an integer.

(a) Express the inverse function f^{-1} in the form $f^{-1}(x) = ...$

$y = \frac{k}{x}$

$yx = k$

$x = \frac{k}{y}$ $\quad f^{-1}(x) = \frac{k}{x}$

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

(1)

The function g is such that $g(x) = 2 - 3x^4$ where $x \neq 0$

The function h is such that $h(x) = \frac{3x}{2-x}$ where $x \neq 2$

(b) (i) Find g(−2)

$g(-2) = 2 - 3(-2)^4$

$= -46$

.....

(1)

(ii) Express the composite function hg in the form $hg(x) = ...$
Give your answer in its simplest form.

$\frac{3(2-3x^4)}{2-(2-3x^4)} = \frac{6-9x^4}{3x^4}$

$= \frac{2-3x^4}{x^4}$

$hg(x) =$ .....

(2)

(Total for Question 18 is 4 marks)

June 2022 Paper 2HR

19 $f(x) = x^2 - 4$

$g(x) = 2x + 1$

Solve $fg(x) > 0$

Show clear algebraic working.

$fg(x) > 0$

$(2x+1)^2 - 4 > 0$

$4x^2 + 2x + 2x + 1 - 4 > 0$

$4x^2 + 4x - 3 > 0$

$\frac{-4 \pm \sqrt{4^2 - 4(4)(-3)}}{2(4)}$ $x = -\frac{3}{2}$ $x = \frac{1}{2}$

$x < -\frac{3}{2}$ $x > \frac{1}{2}$

(Total for Question 19 is 4 marks)

January 2019 P1H

19 g is the function with domain $x \geqslant -3$ such that $g(x) = x^2 + 6x$

(a) Write down the range of g^{-1}

domain $g(x)$ = range $g^{-1}(x)$

$y \geq -3$

(1)

(b) Express the inverse function g^{-1} in the form $g^{-1}: x \mapsto \ldots$

$y = x^2 + 6x$

$y = (x+3)^2 - 9$

$y + 9 = (x+3)^2$

$\pm\sqrt{y+9} = x + 3$

$-3 \pm \sqrt{y+9} = x$

$-3 \pm \sqrt{x+9} = g^{-1}(x)$

$g^{-1}: x \mapsto$ .....

(4)

(Total for Question 19 is 5 marks)

November 2023 P2H

19 The functions f and g are such that

$$f: x \mapsto 5x + 7$$

$$g: x \mapsto \frac{5}{2x - 9}$$

(a) State which value of x cannot be included in any domain of g

$2x - 9 = 0$

$2x = 9$

$x = 9/2$

.....

(1)

(b) Find fg(4)

$g(4) = \frac{5}{2(4)-9} = -5$

$f(-5) = 5(-5) + 7$

$= -18$

.....

(2)

The function h is such that

$$h: x \mapsto 3x^2 - 12x + 8 \quad \text{where } x > 2$$

(c) Express the inverse function h^{-1} in the form $h^{-1}: x \mapsto ...$

$y = 3x^2 - 12x + 8$

$y = 3[x^2 - 4x + \frac{8}{3}]$

$y = 3[(x-2)^2 - 4 + \frac{8}{3}]$

$y = 3[(x-2)^2 + \frac{4}{3}]$

$y = 3(x-2)^2 + 4$

$y + 4 = 3(x-2)^2$

$\frac{y-4}{3} = (x-2)^2$

$\sqrt{\frac{y-4}{3}} = x - 2$

$2 + \sqrt{\frac{y+4}{3}} = x$

$2 + \sqrt{\frac{x+4}{3}} = h^{-1}(x)$

$h^{-1}: x \mapsto$ .....

(4)

(Total for Question 19 is 7 marks)

June 2018 Paper 1HR

20 Two functions, f and g are defined as

$$f: x \mapsto 1 + \frac{1}{x} \quad \text{for } x > 0$$

$$g: x \mapsto \frac{x+1}{2} \quad \text{for } x > 0$$

Given that $h = fg$

express the inverse function h^{-1} in the form $h^{-1}: x \mapsto \ldots$

$h = fg$

$h = 1 + \frac{1}{\frac{x+1}{2}}$

$h = 1 + \frac{2}{x+1}$

$y = 1 + \frac{2}{x+1}$

$y - 1 = \frac{2}{x+1}$

$(y-1)(x+1) = 2$

$x + 1 = \frac{2}{y-1}$

$x = \frac{2}{y-1} - 1$

$h^{-1}(x) = \frac{2}{x-1} - 1$

$h^{-1}: x \mapsto$ .....

(Total for Question 20 is 4 marks)

January 2020 P1H

21 The functions f and g are such that

$f(x) = x^2 - 2x$ $\quad$ $g(x) = x + 3$

The function h is such that $h(x) = fg(x)$ for $x \geqslant -2$

Express the inverse function $h^{-1}(x)$ in the form $h^{-1}(x) = \ldots$

$h(x) = fg(x)$

$h(x) = (x+3)^2 - 2(x+3)$

$h(x) = x^2 + 6x + 9 - 2x - 6$

$h(x) = x^2 + 4x + 3$

$y = x^2 + 4x + 3$

$y = (x+2)^2 - 4 + 3$

$y = (x+2)^2 - 1$

$y + 1 = (x+2)^2$

$\sqrt{y+1} = x + 2$

$-2 \pm \sqrt{y+1} = x$

$x \geq -2$

$-2 + \sqrt{x+1} = h^{-1}(x)$

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

(Total for Question 21 is 5 marks)

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January 2021 P1H

22 The function f is such that $f(x) = x^2 - 8x + 5$ where $x \leqslant 4$

Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$

$y = x^2 - 8x + 5$

$y = (x-4)^2 - 16 + 5$

$y = (x-4)^2 - 11$

$y + 11 = (x-4)^2$

$\pm \sqrt{y+11} = x - 4$

$4 \pm \sqrt{y+11} = x$

$x \leq 4$

$4 - \sqrt{x+11} = f^{-1}(x)$

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

(Total for Question 22 is 3 marks)

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January 2019 Paper 1HR

23 The function f is defined as $f(x) = \frac{\sqrt{x^2 + k^2}}{x}$ for $x > 0$ and where k is a positive number.

(a) Find the value of p for which $f^{-1}(p) = k$

$y = \frac{\sqrt{x^2+k^2}}{x}$

$xy = \sqrt{x^2+k^2}$

$x^2y^2 = x^2 + k^2$

$x^2y^2 - x^2 = k^2$

$x^2(y^2-1) = k^2$

$x^2 = \frac{k^2}{y^2-1}$

$x = \sqrt{\frac{k^2}{y^2-1}}$

$x = \frac{k}{\sqrt{y^2-1}}$

$f^{-1}(x) = \frac{k}{\sqrt{x^2-1}}$

$k = \frac{k}{\sqrt{p^2-1}}$

$\sqrt{p^2-1} = \frac{k}{k}$

$p =$ .....

(3)

The function g is defined as $g(x) = x^2$ for $x > 0$

(b) Given that $gf(a) = k$ for $k > 1$
find an expression for a in terms of k.

$\sqrt{p^2-1} = 1$

$p^2 - 1 = 1$

$p^2 = 2$

$p = \sqrt{2}$

$gf(a) = \left(\frac{\sqrt{a^2+k^2}}{a}\right)^2$

$k = \frac{a^2+k^2}{a^2}$

$ka^2 = a^2 + k^2$

$ka^2 - a^2 = k^2$

$a^2(k-1) = k^2$

$a^2 = \frac{k^2}{k-1}$

$a = \sqrt{\frac{k^2}{k-1}}$

$a = \frac{k}{\sqrt{k-1}}$ $a =$ .....

(3)

(Total for Question 23 is 6 marks)

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January 2022 Paper 2HR

23 The functions f and g are such that

$f(x) = x + 25$ $g(x) = x^2 - 12x$

The function h is such that $h(x) = fg(x)$

The domain of h is $\{x : x \leqslant 6\}$

Express the inverse function h^{-1} in the form $h^{-1}(x) = ...$

$fg(x) = (x^2 - 12x) + 25$

$= x^2 - 12x + 25$

$h(x) = fg(x)$

$h(x) = x^2 - 12x + 25$

$y = x^2 - 12x + 25$

$y = (x-6)^2 - 36 + 25$

$y = (x-6)^2 - 11$

$y + 11 = (x-6)^2$

$\pm\sqrt{y+11} = x - 6$

$6 \pm \sqrt{y+11} = x$

$6 \pm \sqrt{x+11} = h^{-1}(x)$

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

(Total for Question 23 is 4 marks)

As domain $x \leq 6$

$h^{-1}(x) = 6 - \sqrt{x+11}$

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June 19 P2H

24 The function f is such that $f(x) = 3x - 2$

(a) Find f(5)

$f(5) = 3(5) - 2$

$= 13$

(1)

The function g is such that $g(x) = 2x^2 - 20x + 9$ where $x \geqslant 5$

(b) Express the inverse function g^{-1} in the form $g^{-1}(x) = ...$

$y = 2x^2 - 20x + 9$

$y = 2[x^2 - 10x + \frac{9}{2}]$

$y = 2[(x-5)^2 - 25 + \frac{9}{2}]$

$y = 2[(x-5)^2 - \frac{41}{2}]$

$y = 2(x-5)^2 - 41$

$y + 41 = 2(x-5)^2$

$\frac{y+41}{2} = (x-5)^2$

$\pm\sqrt{\frac{y+41}{2}} = x - 5$

$5 \pm \sqrt{\frac{y+41}{2}} = x$

$5 \pm \sqrt{\frac{x+41}{2}} = g^{-1}(x)$

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

(4)

$x \geq 5$

$5 + \sqrt{\frac{x+41}{2}} = g^{-1}(x)$

(Total for Question 24 is 5 marks)

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June 2021 P1H

24 The functions f and g are defined as

$f(x) = 5x^2 - 10x + 7$ where $x \geqslant 1$

$g(x) = 7x - 6$

(a) Find fg(2)

$g(2) = 7(2) - 6$

$= 8$

$f(8) = 5(8)^2 - 10(8) + 7$

$= 247$

(2)

(b) Express the inverse function f^{-1} in the form $f^{-1}(x) = ...$

$f(x) = 5x^2 - 10x + 7$

$y = 5[x^2 - 2x + \frac{7}{5}]$

$y = 5[(x-1)^2 - 1 + \frac{7}{5}]$

$y = 5[(x-1)^2 + \frac{2}{5}]$

$y = 5(x-1)^2 + 2$

$y - 2 = 5(x-1)^2$

$\frac{y-2}{5} = (x-1)^2$

$\pm\sqrt{\frac{y-2}{5}} = x - 1$

$1 \pm \sqrt{\frac{y-2}{5}} = x$

$x \geq 1$

$1 + \sqrt{\frac{x-2}{5}} = f^{-1}(x)$

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

(4)

(Total for Question 24 is 6 marks)

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Turn over ▶

January 2023 P2H

25 The function f is such that $f(x) = 3x^2 - 12x + 7$ where $x \leqslant 2$

Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$

$f(x) = 3x^2 - 12x + 7$

$y = 3[x^2 - 4x + \frac{7}{3}]$

$y = 3[(x-2)^2 - 4 + \frac{7}{3}]$

$y = 3[(x-2)^2 - \frac{5}{3}]$

$y = 3(x-2)^2 - 5$

$y+5 = 3(x-2)^2$

$\frac{y+5}{3} = (x-2)^2$

$\pm\sqrt{\frac{y+5}{3}} = x-2$

$2 \pm \sqrt{\frac{y+5}{3}} = x$

$x \leq 2$

$2 - \sqrt{\frac{x+5}{3}} = f^{-1}(x)$

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

(Total for Question 25 is 4 marks)

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25 The function g is defined as

$g: x \mapsto 5 + 6x - x^2$ with domain $\{x : x \geqslant 3\}$

(a) Express the inverse function g^{-1} in the form $g^{-1}: x \mapsto \ldots$

$y = 5 + 6x - x^2$

$y = -x^2 + 6x + 5$

$y = -[x^2 - 6x - 5]$

$y = -[(x-3)^2 - 9 - 5]$

$y = -[(x-3)^2 - 14]$

$y = -(x-3)^2 + 14$

$y + (x-3)^2 = 14$

$(x-3)^2 = 14 - y$

$x - 3 = \pm\sqrt{14-y}$

$x = 3 \pm \sqrt{14-y}$

$x \geq 3$

$g^{-1}(x) = 3 + \sqrt{14-x}$ $g^{-1}: x \mapsto$ .....

(4)

(b) State the domain of g^{-1}

Can not $\sqrt{\text{negative}}$

$x \leq 14$

.....

(1)

(Total for Question 25 is 5 marks)

25 The function f is such that $f(x) = 2x^2 - 24x + 7$ where $x \geqslant 6$

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

$f(x) = 2x^2 - 24x + 7$

$= 2\left[x^2 - 12x + \frac{7}{2}\right]$

$= 2\left[(x-6)^2 - 36 + \frac{7}{2}\right]$

$= 2\left[(x-6)^2 - \frac{65}{2}\right]$

$y = 2(x-6)^2 - 65$

$y + 65 = 2(x-6)^2$

$\frac{y+65}{2} = (x-6)^2$

$\pm\sqrt{\frac{y+65}{2}} = x - 6$

$6 \pm \sqrt{\frac{y+65}{2}} = x$

$x \geq 6$

$6 + \sqrt{\frac{y+65}{2}} = f^{-1}(x)$

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

(Total for Question 25 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS