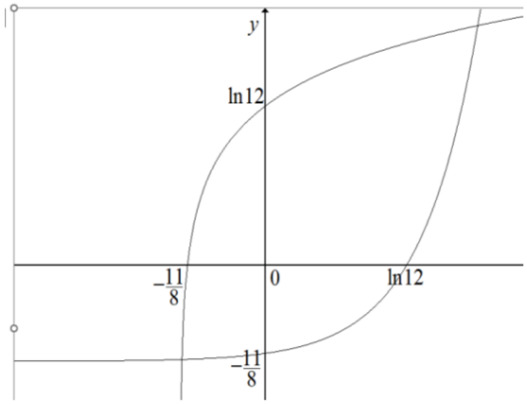
1.

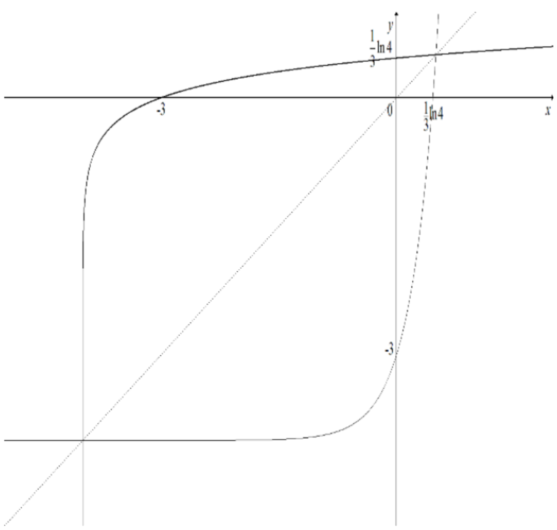
3(a)	$f(x) \in \mathbb{R}$ oe	**B1**	Must be using correct notation, allow $y \in$
3(b)	$5(\ln(3x+1)) - 7 = 13$	**M1**	For correct order
	$x = \dfrac{e^4 - 1}{2}$	**2**	**M1** for a correct attempt to solve to get $x =$, allow one sign error **Dep** on previous M mark **A1** all correct must be exact
3(c)	$(f'(x) =)\ \dfrac{2}{2x+1}$	**2**	**M1** for $\dfrac{a}{2x+1}$ **A1** all correct
	$(g^{-1}(x) =)\ \dfrac{x+7}{5}$	**B1**	soi
	$2x^2 + 15x - 3 = 0$	**M1**	for equating and forming a 3-term quadratic equation = 0
	$x = 0.195, -7.69$	**M1**	For solution of *their* 3-term quadratic
	$x = 0.195$	**A1**	For discounting negative root.

2.

8(a)	-1.5	**B1**	
8(b)	$f \in \mathbb{R}$	**B1**	Allow $y \in \mathbb{R}$, $\mathbb{R}$, $-\infty < f(x) < \infty$ oe, $f(x) \in \mathbb{R}$
8(c)	$\ln(8x+12)$ or $\ln(4(2x+3))$	**B1**	May be implied
	$f^{-1}(x) = \dfrac{e^x - 12}{8}$ oe	**2**	**M1** for attempt to find the inverse, allow one sign error **A1** allow $y = \ldots$
	Range: $f^{-1} > \textit{their}(-1.5)$	**B1**	Must be correct notation, follow through on *their* **(a)** $f^{-1}(x) > \textit{their}(-1.5)$, $y > \textit{their}(-1.5)$
	Alternative		
	$f^{-1}(x) = \dfrac{e^{x-\ln 4} - 3}{2}$ oe	**(3)**	**B1** for $e^{x-\ln 4}$ or $e^{y-\ln 4}$ **M1** for attempt to find the inverse, allow one sign error **A1** allow $y = \ldots$
	Range: $f^{-1} > \textit{their}(-1.5)$	**(B1)**	Must be correct notation, follow through on *their* **(a)** $f^{-1}(x) > \textit{their}(-1.5)$, $y > \textit{their}(-1.5)$

8(d)		4	**B1** for correct shape of $f(x)$ in quadrants 1, 2 and 3, with asymptotic behaviour **B1** for ln12 and $-\frac{11}{8}$ or -1.375 in correct position, must have a correct shape. **B1** for correct shape of $f^{-1}(x)$ in quadrants 1, 3 and 4, with asymptotic behaviour **B1** for ln12 and $-\frac{11}{8}$ or -1.375 in correct position, must have a correct shape and intersect at least once with $y = f(x)$

3.

6(a)	$f > -4$	**B1**	Allow $y > -4$ or $-4 < f < \infty$ or $f \in (-4, \infty)$
6(b)	$\left[f^{-1}(x) =\right] \frac{1}{3}\ln(x+4)$	2	**M1** for a correct method to find the inverse, allow one sign error Must be in the form of $3x = \ln(y \pm 4)$ or $3y = \ln(x \pm 4)$ **A1** allow $y =$
6(c)		4	**B1** for f(x) with correct shape in quadrant 1, 3 and 4 and appropriate asymptotic behaviour **B1** for –3 on the y-axis and $\frac{1}{3}\ln 4$ on the x-axis for f(x) must have the correct shape **B1** for $f^{-1}(x)$with correct shape in quadrant 1, 2 and 3 and appropriate asymptotic behaviour **B1** for –3 on the x-axis and $\frac{1}{3}\ln 4$ on the y-axis for $f^{-1}(x)$ must have correct shape and intersect at least once

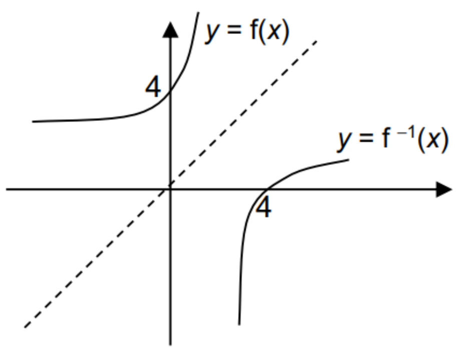
4.

5(a)	$f \geqslant -4$	**2**	**M1** for a valid method to find the least value of x^2+4x **A1** for $f \geqslant -4$, $y \geqslant -4$ or $f(x) \geqslant -4$
5(b)	$g > 1$	**B1**	Allow $y>1$ or $g(x)>1$
5(c)	$(1+e^{2x})^2+4(1+e^{2x})[=21]$	**M1**	
	$e^{4x}+6e^{2x}-16=0$ $(e^{2x}+8)(e^{2x}-2)=0$	**M1**	**Dep** for quadratic in terms of e^{2x} and attempt to solve to obtain $e^{2x}=k$
	$e^{2x}=2$ $x=\frac{1}{2}\ln k$	**M1**	**Dep** on both previous M marks, for attempt to solve $e^{2x}=k$
	$x=\ln\sqrt{2}$ or $\ln 2^{\frac{1}{2}}$	**A1**	

5.

13(a)	$[fg(x)=]\dfrac{2\left(\frac{1}{x}\right)^2-1}{3\left(\frac{1}{x}\right)}$ oe	**M1**	
	$[fg(x)=]\dfrac{2-x^2}{3x}$ or $\dfrac{2}{3x}-\dfrac{x}{3}$	**A1**	mark final answer
13(b)(i)	$f^{-1}>0$	**B1**	
13(b)(ii)	$2x^2-3xy-1=0$ or $2y^2-3xy-1=0$	**B1**	
	Correctly applies quadratic formula: $[x=]\dfrac{-(-3y)\pm\sqrt{(-3y)^2-4(2)(-1)}}{2(2)}$ oe or $[y=]\dfrac{-(-3x)\pm\sqrt{(-3x)^2-4(2)(-1)}}{2(2)}$ oe	**M1**	**FT** *their* $2x^2-3xy-1=0$ or $2y^2-3xy-1=0$ with at most one sign error in the equation
	Justifies the positive square root at some point	**B1**	
	$f^{-1}(x)=\dfrac{3x+\sqrt{9x^2+8}}{4}$ cao	**A1**	must be a function of x

6.

9(a)	$f > 3$	**B1**	
9(b)	Complete method: Putting $y = f(x)$ and changing subject to x and swapping x and y or swopping x and y and changing subject to y	**M1**	must be a function of x not y
	$f^{-1}(x) = \frac{1}{5}\ln(x-3)$	**A1**	
	[Domain] $x > 3$	**B1**	**FT** *their* part (a) providing *their* part (a) is of the form $f > a$ or $f \geqslant a$, where a is a constant
9(c)	*their* $\ln(x-3) = \ln 1$ soi or *their* $(x-3) = e^0$ soi or $f(0) = 3 + e^{5\times 0}$ soi	**M1**	**FT** *their* $f^{-1}(x)$ of the form $k\ln(\pm x \pm 3)$, where k is a non-zero constant
	$x = 4$	**A1**	
9(d)	Fully correct graph:  	**B4**	**B2** for correct exponential shape for f, in 1st and 2nd quadrants, with correct asymptotic behaviour soi or **B1** for a correct exponential shape for f, in 1st and 2nd quadrants, with asymptotic behaviour but to a clearly incorrect line $y = k$ soi **B1** for f^{-1} reflection of f in the line $y = x$ **B1** for intercepts (0, 4) and (4, 0) and no others; must have attempted correct exponential and logarithmic shapes **Maximum of 3 marks if not fully correct**

7.

1(a)	$-3 < x < 1 \qquad x > 5$	**B1**	
1(b)	$-\frac{1}{3}(x+3)(x-1)(x-5)$	**3**	**B1** for a negative cubic function **B1** for a cubic function multiplied by $\frac{1}{3}$ **B1** for $(x+3)(x-1)(x-5)$

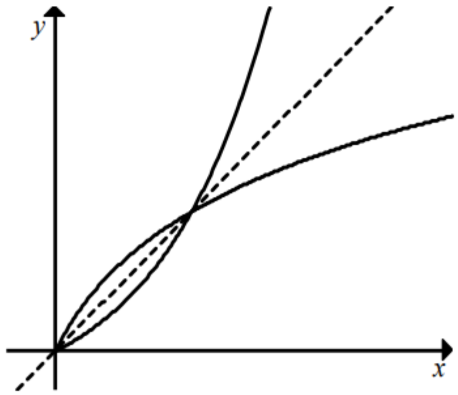
8.

1(a)	$y = -\frac{1}{2}(x+2)(x+1)(x-5)$	**B1**	For $-\frac{1}{2}$
		B1	For $(x+2)(x+1)(x-5)$
1(b)	$-2 \leqslant x \leqslant -1$	**B1**	
	$x \geqslant 5$	**B1**	

9.

5(a)	$f > 9$	**B1**	Allow y but not x
5(b)	It is a one-one function because of the restricted domain	**B1**	
5(c)	$x = (2y+3)^2$ or equivalent	**M1**	For a correct attempt to find the inverse
	$y = \frac{\sqrt{x}-3}{2}$	**M1**	For correct rearrangement
	$f^{-1} = \frac{\sqrt{x}-3}{2}$	**A1**	Must have correct notation
5(d)	$x > 9$	**B1**	**FT** on *their* (a)
5(e)	$f(\ln(x+4)) = 49$	**M1**	For correct order
	$(2\ln(x+4)+3)^2 = 49$ $\ln(x+4) = 2$	**M1**	For correct attempt to solve, dep on previous M mark, as far as $x =$
	$x = e^2 - 4$	**A1**	

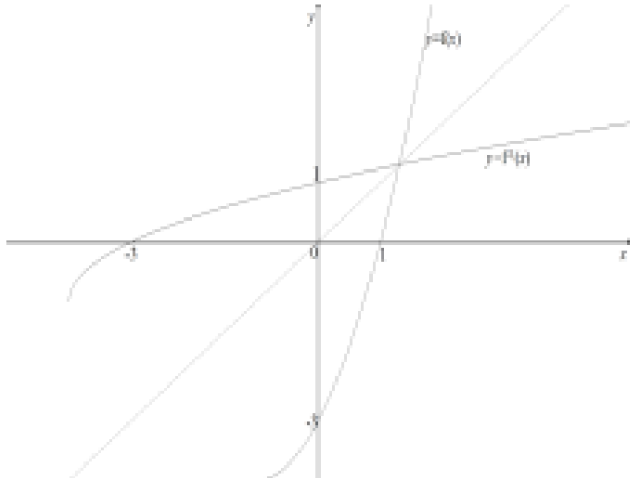
10.

11(a)		**B3**	**B1** for correct shape of f or f⁻¹ **B1** for symmetry **B1** for drawn over correct domain **Maximum of 2 marks if not fully correct**
11(b)(i)	$[\pm]\sqrt{x-1}=y-4$ soi	**M1**	
	$g^{-1}(x)=4-\sqrt{x-1}$	**A1**	
	[Range] $g^{-1} \leqslant 4$	**B1**	
	[Domain] $x \geqslant 1$	**B1**	
11(b)(ii)	$\ln(2[(x-4)^2+1]+1)$	**M1**	
	$\ln(2x^2-16x+35)$	**A1**	
11(b)(iii)	Valid explanation, e.g. some of the values in the range of f are outside the domain of g	**B1**	

11.

2(a)	$y=-\frac{1}{2}(x+5)(x+1)(x-2)$	**3**	**B1** for negative soi **B1** for $\frac{1}{2}$ soi **B1** for $(x+5)(x+1)(x-2)$ or $x^3+4x^2-7x-10$
2(b)	$-5<x<-1$	**B1**	
	$x>2$	**B1**	

12.

6(a)	It is a one-one function because of the given restricted domain or because $x \geqslant -1$	**B1**	
6(b)		**4**	**B1** for $y = \mathrm{f}(x)$ for $x > -1$ only **B1** for 1 on x-axis and –3 on y-axis for $y = \mathrm{f}(x)$ **B1** for $y = \mathrm{f}^{-1}(x)$ as a reflection of $y = \mathrm{f}(x)$ in the line $y = x$, maybe implied by intercepts with axes **B1** for 1 on y-axis and –3 on x-axis for $y = \mathrm{f}^{-1}(x)$

13.

3(a)(i)	$x > \frac{1}{2}$	**B1**	Must be using x
3(a)(ii)	$x = 4\ln(2y-1)$ $\mathrm{e}^{\frac{x}{4}} = 2y - 1$ $y = \frac{1}{2}\left(1 + \mathrm{e}^{\frac{x}{4}}\right)$	**M1**	For full method for inverse using correct order of operations
	$\mathrm{f}^{-1}(x) = \frac{1}{2}\left(1 + \mathrm{e}^{\frac{x}{4}}\right)$ or $\mathrm{f}^{-1}(x) = \frac{1}{2}\left(1 + \sqrt[4]{\mathrm{e}^x}\right)$	**A1**	Must be using correct notation
	$x \in \mathbb{R}$	**B1**	
3(b)	$\sqrt{2x-3} + 5 = 7$	**M1**	For correct order
	$x = \frac{2^2 + 3}{2}$	**M1**	Dep on previous M mark, for obtaining x by simplifying and solving using correct order of operations, including squaring
	$x = \frac{7}{2}$ or 3.5	**A1**	

14.

8(i)	$f > -1$	**B1**	or $f(x) > -1$, $y > -1$, $(-1, \infty)$, $\{y : y > -1\}$
8(ii)	$e^y = \frac{x+1}{5}$ oe	**M1**	a complete valid method to obtain the inverse function
	$y = \ln\left(\frac{x+1}{5}\right)$ or $f^{-1}(x) = \ln\left(\frac{x+1}{5}\right)$ oe	**A1**	
	Domain $x > -1$ or $(-1, \infty)$	**B1**	**FT** *their* **(i)** or correct
8(iii)	$g(1) = 5$ so $fg(1) = f(5)$	**M1**	evaluation using correct order of operations
	$5e^5 - 1 = 741$	**A1**	awrt 741 or $5e^5 - 1$
8(iv)	$g^2(x) = (x^2 + 4)^2 + 4$	**M1**	correct use of g^2
	$x^4 + 8x^2 + 16 + 4 = 40$ $(x^2 + 4)^2 = 36$ or $x^4 + 8x^2 - 20 = 0$ $(x^2 + 10)(x^2 - 2) = 0$	**M1**	**DepM1** for forming and solving a quadratic in x^2
	$x = \pm\sqrt{2}$ only	**A1**	

15.

12(a)(i)	$g > -9$	**B1**	
12(a)(ii)	$x > 1$	**B1**	
12(a)(iii)	$[gf(x) =]\ \ 4(5x-2)^2 - 9$	**B1**	
	$100x^2 - 80x - 38 = 0$ or $(5x-2)^2 = \frac{45+9}{4}$	**M1**	
	$[x =]\ \ \frac{-(-80) \pm \sqrt{(-80)^2 - 4(100)(-38)}}{2(100)}$ leading to $\frac{4+3\sqrt{6}}{10}$ oe only or $\frac{1}{5}\left(2+\sqrt{\frac{54}{4}}\right)$ or better only	**A1**	
12(b)(i)	(They are) **reflections** (of each other) in (the line) $\boldsymbol{y = x}$ oe	**B1**	
12(b)(ii)	$x^2 = y^2 + 1$ or $y^2 = x^2 + 1$	**M1**	
	$x = [\pm]\sqrt{y^2+1}$ or $y = [\pm]\sqrt{x^2+1}$	**A1**	
	$-\sqrt{x^2+1}$ nfww	**A1**	

16.

5a(i)	fg	**B1**	
5a(ii)	g^{-1}	**B1**	
5a(iii)	f^{-1}	**B1**	
5a(iv)	g^2	**B1**	
5(b)(i)	Undefined at $x = 0$ oe	**B1**	
5(b)(ii)	$4 = a + b$ $h'(x) = \frac{p}{x^3}$ and attempt at $h'(1)$	**M1**	For attempt at $h(1)$ and differentiation to obtain $h'(1)$, must have the form $h'(x) = \frac{p}{x^3}$ oe
	$b = -8$ $a = 12$	**A1**	For both

17.

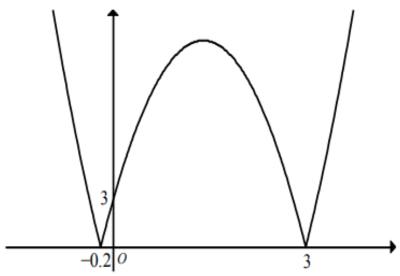
10(i)	$\mathrm{gf}(x) = \mathrm{e}^{2(\ln(3x+2))} - 4$	**B1**	
	their gf = 5	**M1**	
	use $\ln a^p = p\ln a$ or $\mathrm{e}^{\ln a} = a$ or $\ln \mathrm{e}^a = a$	**B1**	correct use of log/exponential relationship seen anywhere
	$3x + 2 = 3$ or $(3x + 2)^2 = 9$	**A1**	3 may take the form of $\mathrm{e}^{0.5\ln 9}$ 9 may take the form of $\mathrm{e}^{\ln 9}$
	$x = \frac{1}{3}$ only	**A1**	
10(ii)	$x = \frac{\mathrm{e}^y - 2}{3}$	**M1**	find x in terms of y
	$\frac{\mathrm{e}^x - 2}{3}\ \left(= \mathrm{f}^{-1}(x) \text{ or } = y\right)$	**A1**	interchange x and y correct completion
10(iii)	$\frac{\mathrm{e}^x - 2}{3} = \mathrm{e}^{2x} - 4$	**M1**	*their* $\mathrm{f}^{-1}(x) = \mathrm{g}(x)$
	$3\mathrm{e}^{2x} - \mathrm{e}^x - 10\ \ (= 0)$	**A1**	obtain quadratic in e^x must be arranged as a three term quadratic in order shown
	$(3\mathrm{e}^x + 5)(\mathrm{e}^x - 2)\ \ (= 0)$	**M1**	solve for e^x
	$x = \ln 2$ or 0.693 only	**A1**	

18.

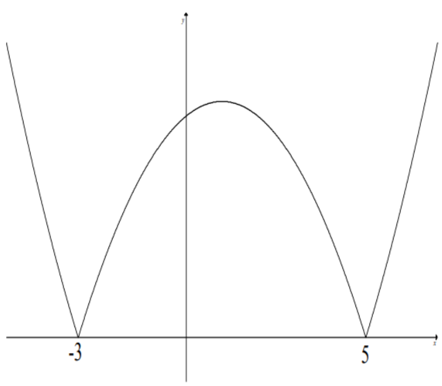
3	(table below)	4	**B1** for either each row correct or each column correct – mark to candidate's advantage.

A	B	C	D
	✓		
		✓	✓
		✓	
✓			

19.

9(i)	$5\left(x-\frac{7}{5}\right)^2-\frac{64}{5}$	**B3**	**B1** for each of p, q, r correct in correct format; allow correct equivalent values. If **B0**, then **SC2** for $5\left(x-\frac{7}{5}\right)-\frac{64}{5}$ or **SC1** for correct values but incorrect format
9(ii)		**B4**	**B2** for fully correct shape in correct position or **B1** for fully correct shape translated parallel to the x-axis **B1** for y-intercept at (0, 3) marked on graph **B1** for roots marked on graph at –0.2 and 3
9(iii)	$0 < k < \left\| their\left(-\frac{64}{5}\right)\right\|$	**B2**	**FT** *their* **(i)** **B1** for any inequality using *their* $\frac{64}{5}$ or max y value is *their* 12.8soi

20.

10(a)(i)		**B2**	**B1** for correct shape **B1** for roots marked on the graph or seen nearby provided graph drawn and one root is negative and one is positive
10(a)(ii)	Any correct domain	**B1**	
10(b)(i)	$\frac{4}{3x-1}$	**B1**	mark final answer

10(b)(ii)	Correct method for finding inverse function e.g. swopping variables **<u>and</u>** changing subject or vice versa; or indicates $(\text{hg})^{-1}(x) = \text{g}^{-1}\text{h}^{-1}(x)$ and finds $\text{g}^{-1}(x) = \frac{x+1}{3}$ and $\text{h}^{-1}(x) = \frac{4}{x}$	**M1**	**FT** only if *their* $\text{hg}(x)$ of the form $\frac{a}{bx+c}$ where *a, b* and *c* are integers
	$\left[(\text{hg})^{-1}(x) =\right] \frac{1}{3}\left(\frac{4}{x}+1\right)$ oe isw or $\left[(\text{hg})^{-1}(x) =\right] \frac{4+x}{3x}$ oe isw	**A1**	**FT** *their* $(\text{hg})^{-1}(x) = \frac{a-cx}{bx}$ oe If **M0** then **SC1** for *their* $\text{hg}(x)$ of the form $y = \frac{a}{x}+b$ oe leading to *their* $(\text{hg})^{-1}(x)$ of the form $y = \frac{a}{x-b}$ isw
10(c)	*a* cao	**B1**	

21.

10(a)(ii)	Any correct domain	**B1**	
10(a)(ii)	Any correct domain	**B1**	
10(b)(i)	$\frac{4}{3x-1}$	**B1**	mark final answer
10(b)(ii)	Correct method for finding inverse function e.g. swopping variables **<u>and</u>** changing subject or vice versa; or indicates $(\text{hg})^{-1}(x) = \text{g}^{-1}\text{h}^{-1}(x)$ and finds $\text{g}^{-1}(x) = \frac{x+1}{3}$ and $\text{h}^{-1}(x) = \frac{4}{x}$	**M1**	**FT** only if *their* $\text{hg}(x)$ of the form $\frac{a}{bx+c}$ where *a, b* and *c* are integers
	$\left[(\text{hg})^{-1}(x) =\right] \frac{1}{3}\left(\frac{4}{x}+1\right)$ oe isw or $\left[(\text{hg})^{-1}(x) =\right] \frac{4+x}{3x}$ oe isw	**A1**	**FT** *their* $(\text{hg})^{-1}(x) = \frac{a-cx}{bx}$ oe If **M0** then **SC1** for *their* $\text{hg}(x)$ of the form $y = \frac{a}{x}+b$ oe leading to *their* $(\text{hg})^{-1}(x)$ of the form $y = \frac{a}{x-b}$ isw
10(c)	*a* cao	**B1**	

22.

11(i)	$\text{gf}(x) = \frac{2(4x-3)+1}{3(4x-3)-1}$	**M1**	
	$= \frac{8x-5}{12x-10}$	**A1**	
11(ii)	$y(3x-1) = 2x+1$ or $x(3y-1) = 2y+1$	**B1**	
	$(3y-2)x = y+1$ or $(3x-2)y = x+1$	**M1**	
	$\text{g}^{-1}(x) = \frac{x+1}{3x-2}$	**A1**	
11(iii)	$4\left(\frac{2x+1}{3x-1}\right) - 3[= x-1]$	**B1**	
	$3x^2 - 3x - 6$ oe	**B1**	
	$3(x+1)(x-2)$	**M1**	
	$x = 2$ only	**A1**	

23.

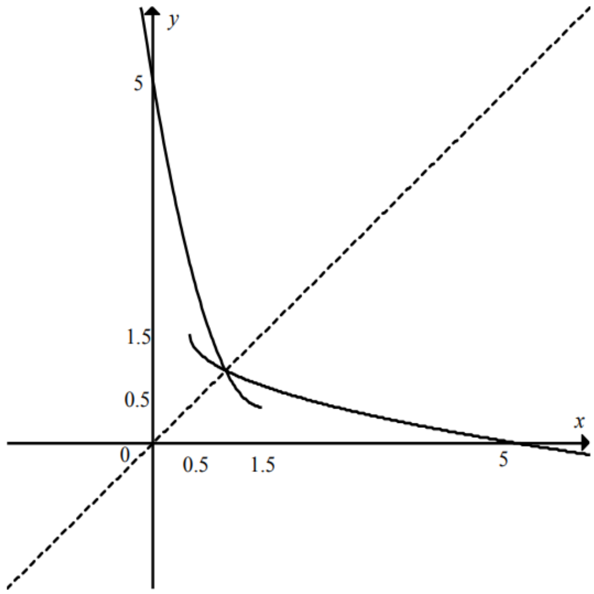
8(i)	$5 \leqslant f(x) \leqslant 6$ or $[5,6]$ oe	**B2**	**B1** for $5 \leqslant f(x) \leqslant p$ $(p > 5)$ or for $q \leqslant f(x) \leqslant 6$ $(q < 6)$
8(ii)	$x = \sin\frac{y}{4} + 5$	**M1**	complete valid attempt to obtain the inverse with operations in correct order.
	$y = 4\sin^{-1}(x-5)$	**A1**	
	Range $0 \leqslant y \leqslant 2\pi$	**B1**	
8(iii)	$2\left(\sin\frac{\left(x-\frac{\pi}{3}\right)}{4}+5\right)$ $(=11)$	**B1**	for $\sin\frac{\left(x-\frac{\pi}{3}\right)}{4}+5$
	$\sin\frac{\left(x-\frac{\pi}{3}\right)}{4} = \frac{1}{2}$	**M1**	for $\sin\frac{\left(x-\frac{\pi}{3}\right)}{4} = k$
	$x = 4\sin^{-1}\left(\frac{1}{2}\right)+\frac{\pi}{3}$ oe	**M1**	**Dep** for use of $\sin^{-1}$ and correct order of operations to obtain x. Allow one +/– or ×/ ÷ sign error
	$x = \pi$ or 3.14	**A1**	$x = \pi$ and no other solutions in range

24.

4(a)(i)	$f > 5$, $f(x) > 5$	**B1**	
4(a)(ii)	$\frac{y-5}{3} = e^{-4x}$ or $\frac{x-5}{3} = e^{-4y}$	**B1**	
	$-4x = \ln\left(\frac{y-5}{3}\right)$ or $-4y = \ln\left(\frac{x-5}{3}\right)$	**B1**	
	leading to $f^{-1}(x) = -\frac{1}{4}\ln\left(\frac{x-5}{3}\right)$ or $f^{-1}(x) = \frac{1}{4}\ln\left(\frac{3}{x-5}\right)$ or $f^{-1}(x) = \frac{1}{4}(\ln 3 - \ln(x-5))$ or $f^{-1}(x) = -\frac{1}{4}(\ln(x-5) - \ln 3)$	**B1**	
	Domain $x > 5$	**B1**	
4(b)	$\ln(x^2+5) = 2$	**B1**	
	$x^2 + 5 = e^2$	**B1**	
	$x = 1.55$ or better or $\sqrt{e^2 - 5}$	**B1**	

25.

$2(x-1.5)^2 + 0.5$ isw	**B3**	or **B3** for $a = 2$ and $b = 1.5$ and $c = 0.5$ provided not from wrong format isw or **B2** for $2(x-1.5)^2 + c$ where $c \neq 0.5$ or $a = 2$ and $b = 1.5$ or **SC2** for $2(x-1.5)+0.5$ or $2\left((x-1.5)^2 + \frac{1}{4}\right)$ seen or **B1** for $(x-1.5)^2$ seen or for $b = 1.5$ or for $c = 0.5$ or **SC1** for 3 correct values seen in incorrect format e.g. $2(x-1.5x)+0.5$ or $2(x^2-1.5)+0.5$

 	**B3**	**B1** for correct graph for f over correct domain or correct graph for f – 1 over correct domain **B1** for vertex marked for f or f – 1 and intercept marked for f or f – 1 **B1** for idea of symmetry – either symmetrical by eye, ignoring any scale or line $y = x$ drawn and labelled Maximum of 2 marks if not fully correct
$\frac{x-0.5}{2} = (y-1.5)^2$	**M1**	**FT** *their a,b,c*, provided *their a* $\neq 1$ and *a,b,c* are all non-zero constants or $\frac{y-0.5}{2} = (x-1.5)^2$ and reverses variables at some point
$f^{-1}(x) = 1.5 - \sqrt{\frac{x-0.5}{2}}$ oe	**A1**	must have selected negative square root only; condone $y =$ ... etc.; must be in terms of x
		If M0 then **SC2** for $f^{-1}(x) = \frac{6-\sqrt{8x-4}}{4}$ oe or **SC1** for $f^{-1}(x) = \frac{-(-6) \pm \sqrt{36-4(2)(5-x)}}{2(2)}$ oe
$x \geqslant \frac{1}{2}$ oe	**B1**	

26.

6(i)	$y \in \mathbb{R}$ oe	**B1**	Must have correct notation i.e. no use of x
6(ii)	$y > 3$ oe	**B1**	Must have correct notation i.e. no use of x
6(iii)	$f^{-1}(x) = e^x$ or $g(4) = 35$	**B1**	First B1 may be implied by correct answer or by use of 35
	$f^{-1}g(4) = e^{35}$	**B1**	
6(iv)	$\frac{y-3}{2} = x^2$ or $\frac{x-3}{2} = y^2$	**M1**	valid attempt to obtain the inverse
	$g^{-1}(x) = \sqrt{\frac{x-3}{2}}$	**A1**	correct form, must be $g^{-1}(x) =$ or $y =$
	Domain $x > 3$	**B1**	Must have correct notation

27.

6(i)	$f^2 = f(f)$ used algebraic $([(x+2)^2+1]+2)^2+1$	**M1**	numerical or algebraic
	17	**A1**	
6(ii)	$x = \frac{y-2}{2y-1}$	**M1**	change x and y
	$2xy - x = y - 2 \rightarrow y(2x-1) = x-2$	**M1**	**M1dep** multiply, collect y terms, factorise
	$y = \frac{x-2}{2x-1}$ $[= g(x)]$	**A1**	correct completion
6(iii)	$gf(x) = \frac{[(x+2)^2+1]-2}{2[(x+2)^2+1]-1}$ oe	**B1**	
	$\frac{(x+2)^2-1}{2(x+2)^2+1} = \frac{8}{19}$ $3(x+2)^2 = 27$ oe $3x^2 + 12x - 15 = 0$	**M1**	*their* gf $= \frac{8}{19}$ and simplify to quadratic equation
	solve quadratic	**M1**	**M1dep** Must be of equivalent form
	$x = 1$ $x = -5$	**A1**	