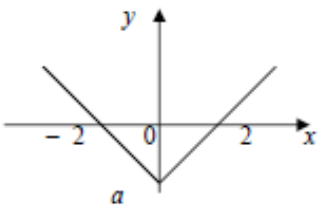
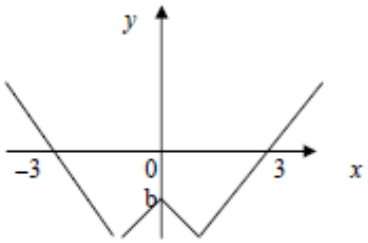
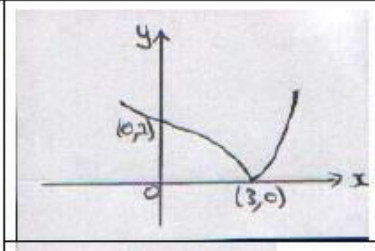
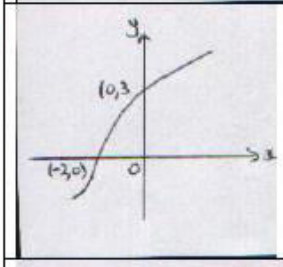
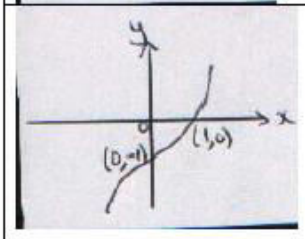
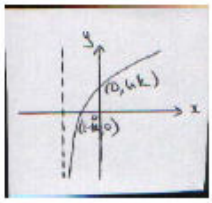
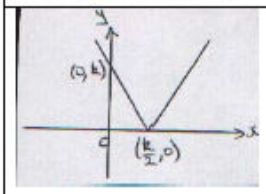
Question Number	Scheme	Marks
3(a)	$\frac{5x+1}{(x+2)(x-1)} - \frac{3}{x+2}$	B1
	$= \frac{5x+1-3(x-1)}{(x+2)(x-1)}$	M1
	M1 for combining fractions even if the denominator is not lowest common	
	$= \frac{2x+4}{(x+2)(x-1)} = \frac{2(x+2)}{(x+2)(x-1)} = \frac{2}{x-1}$ *	M1 A1 cso
	M1 must have linear numerator	(4)
(b)	$y = \frac{2}{x-1} \Rightarrow xy - y = 2 \Rightarrow xy = 2 + y$	M1A1
	$f^{-1}(x) = \frac{2+x}{x}$ o.e.	A1
		(3)
(c)	$fg(x) = \frac{2}{x^2+4}$ (attempt) $\left[\frac{2}{"g"-1}\right]$	M1
	Setting $\frac{2}{x^2+4} = \frac{1}{4}$ and finding $x^2 = \ldots$; $x = \pm 2$	M1; A1
		(3)
		[10]

Question Number	Scheme		Marks
6. (a)		Translation ← by 1 Intercepts correct	M1 A1 (2)
(b)		$x \geq 0$, correct "shape" provided graph is not original graph Reflection in y-axis Intercepts correct	B1 B1√ B1 (3)
(c)	$a = -2, \quad b = -1$		B1B1 (2)
(d)	Intersection of $y = 5x$ with $y = -x - 1$ Solving to give $x = -\frac{1}{6}$		M1A1 M1A1 (4)
	[Notes: (i) If both values found for $5x = -x - 1$ and $5x = x - 3$, or solved algebraically, can score 3 out of 4 for $x = -\frac{1}{6}$ and $x = -¾$; required to eliminate $x = -¾$ for final mark. (ii) Squaring approach: M1 correct method, $24x^2 + 22x + 3 = 0$ (correct 3 term quadratic, any form) A1 Solving M1, Final correct answer A1.]		[11]

Question Number		Scheme		Marks	
3.	(*a*)		Mod graph, reflect for $y < 0$ (0, 2), (3, 0) or marked on axes Correct shape, including cusp	M1 A1 A1	(3)
	(*b*)		Attempt at reflection in $y = x$ Curvature correct (–2, 0), (0, 3) or equiv.	M1 A1 B1	(3)
	(*c*)		Attempt at 'stretches' (0, –1) or equiv. (1, 0)	M1 B1 B1	(3)
					(9 marks)

Question Number	Scheme	Marks
7. (*a*)	 Log graph: Shape	B1
	Intersection with –ve x-axis	dB1
	$(0, \ln k)$, $(1-k, 0)$	B1
	 Mod graph :V shape, vertex on +ve x-axis	B1
	$(0, k)$ and $\left(\frac{k}{2}, 0\right)$	B1 (5)
(*b*)	$f(x) \in R$, $-\infty < f(x) < \infty$, $-\infty < y < \infty$	B1 (1)
(*c*)	$fg\left(\frac{k}{4}\right) = \ln\{k + \lvert\frac{2k}{4} - k\rvert\}$ or $f\left(\lvert-\frac{k}{2}\rvert\right)$	M1
	$= \ln\left(\frac{3k}{2}\right)$	A1 (2)
(*d*)	$\frac{dy}{dx} = \frac{1}{x+k}$	B1
	Equating (with $x = 3$) to grad. of line; $\frac{1}{3+k} = \frac{2}{9}$	M1; A1
	$k =$ 1½	A1√ (4)
		(12 marks)