

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	$\frac{2}{25}$	B1	accept 0.08	
Q1 (b)	$\frac{1}{8}$	M1	$fg(x) = \frac{2}{(4x^3)^2}$ oe or $g(1) = 4$ or $\frac{2}{(4 \times 1^3)^2}$ oe	
		A1	oe	All powers and products must be evaluated

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
19 (a) (b) Q3 (c)	33	B1	cao	
	27	M1	for $f(9) = 12 \div \sqrt{9}$ (=4) and a clear intention to find g("4") or for $3 \times (2 \times \frac{12}{\sqrt{9}} + 1)$ or for stating gf eg $3(2 \times \frac{12}{\sqrt{x}} + 1)$ oe	
		A1	cao	
	$\frac{1}{2}$	M1	for g^{-1} as $\frac{x-3}{6}$ oe or for starting to solve $3(2x + 1) = 6$	Accept $\frac{y-3}{6}$
		A1	for $\frac{1}{2}$ oe	

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Q5	19 (a)	shown	C1	for first step, eg $2((x + 1)^2 - 1)$ or $2(x^2 + 2x + 1 - 1)$ oe	It is insufficient to state $gf(x) = 2x(x + 2)$ without showing the first step, and the following sequence of algebraic steps leading to it. Could be shown in the form of a flowchart, which must show inverse operations.
			C1	for fully correct chain of reasoning	
	(b)	4.5	M1	process to find inverse of g, eg $g^{-1}(x) = \frac{1}{2}x + 1$ or for $2(x - 1) = 7$	
			A1	for 4.5 oe	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
10	(a) 1.56	B1	1.56 to 1.563	If an answer in the range is seen in working and then incorrectly rounded award full marks.
	(b) 3.63	M1	for a complete method to find fg(34) eg $4 \sin 65 (=3.625..)$ or fg(x) eg $4 \sin (2x-3)$	
Q6		A1	for answer in the range 3.6 to 3.63	
	(c) Statement	C1	for statement eg positive and negative square root required. Acceptable examples The other answer is -9 The quadratic should have 2 solutions. Not acceptable examples He has not expanded the brackets. He needed to $(x+4)$ twice as there is a squared sign. $(x+4)^2$ is 16 not 25. Didn't expand the bracket.	

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
18 (a) Q7 18 (b)	Shown	C1	for $f^{-1}(x) = \sqrt[3]{\frac{x+4}{2}}$ OR for $2x^3 - 4 = 50$ OR for substituting $x = 3$ to find $f(3)$	
		C1	for substituting $x = 50$ to show the result giving $f^{-1}(50) = 3$ OR solving for x to give $x = 3$ OR for showing that $f(3) = 50$	
	$x = -1$ and $x = 2.5$	P1	for $hg(x) = (x + 2)^2$	
		P1	(dep) for start to a process to derive a quadratic equation eg. $x^2 + 4x + 4 = 3x^2 + x - 1$	$(x + 2)^2$ must be correctly expanded
		P1	for a process to solve the quadratic equation $2x^2 - 3x - 5 = 0$ eg $(2x - 5)(x + 1) (= 0)$ or $\frac{-3 \pm \sqrt{(-3)^2 - 4 \times 2 \times -5}}{2 \times 2}$ or $2\left[\left(x - \frac{3}{4}\right)^2 - \frac{9}{16} - \frac{5}{2}\right] (= 0)$	
	A1	for $x = -1$ and $x = 2.5$	2.5 or $2\frac{1}{2}$ or $\frac{5}{2}$ acceptable	

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Question	Answer	Mark	Mark scheme	Additional guidance
22	$\frac{x^3 - 3}{2}$	M1	for $(h(x)) = \sqrt[3]{2x + 3}$	
Q8		M1	for a correct first step to find the inverse of $[h(x)]$	[h(x)] must be their composite function and cannot be either $\sqrt[3]{x}$ or $2x + 3$
		A1	oe	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
19 (a) (b) Q9	3	B1	cao	
	$\frac{2}{x^3+5}$	M1	for finding $(g^{-1}(x) =) \frac{x^3+5}{2}$ oe	
		M1	for $(hg^{-1}(x) =) = \frac{1}{[g^{-1}(x)]}$ oe	$[g^{-1}(x)]$ must be their inverse function and cannot be $\sqrt[3]{2x-5}$
		A1	Accept $\left(\frac{x^3+5}{2}\right)^{-1}$	

Paper: 1MA1/2H				
Question	Working	Answer	Mark	Notes
22		7, -1	P1	for strategy to use $g(3) = 20$, e.g. $3a + b = 20$
Q10			P1	for $g(1) = a + b$
			P1	for a process to find inverse of f. e.g. $f^{-1}(x) = \frac{x-3}{5}$ or $f^{-1}(33) = 6$
			P1	for using $f^{-1}(33) = g(1)$ to find an equation e.g. $\frac{33-3}{5} = a + b$
			A1	for $a = 7, b = -1$