

Question	Answer	Marks	AO Element	Notes	Guidance
1	$\frac{3x+1}{5}$	3		M2 for $x = \frac{3y+1}{5}$, $5y = 3x + 1$ or $y - \frac{1}{5} = \frac{3x}{5}$ M1 for $x = \frac{5y-1}{3}$, $3y = 5x - 1$ or $y + \frac{1}{3} = \frac{5x}{3}$	
2	$[p =] -13$	2		M1 for $4(5x - 4) + 3$ or better	
3(a)	19	2		M1 for $3(2^x) - 5$ soi or for $f(8)$	
3(b)	$\frac{x+5}{3}$ oe final answer	2		M1 for correct first step $y + 5 = 3x$ or $\frac{y}{3} = x - \frac{5}{3}$ or $x = 3y - 5$	
4	$5 - 2x$ final answer	2		M1 for $2(1 - x) + 3$ oe	
5(a)	82	2		M1 for $(3^x)^2 + 1$ soi by $(3^2)^2 + 1$ or $g(9)$ isw	

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5(b)	$\frac{x+2}{7}$ final answer	2		M1 for $y + 2 = 7x$ or $\frac{y}{7} = x - \frac{2}{7}$ or $x = 7y - 2$	
5(c)	$[a =] 1, [b =] 2, [c =] 2$	3		B2 for $x^4 + x^2 + x^2 + 1 + 1$ or M1 for $(x^2 + 1)^2 + 1$	
5(d)	$\frac{6}{7}$ oe	3		M2 for $7x - 2 = 4$ or M1 for $3^x = 81$ soi $f(x) = 4$ or for $3^{7x-2} = 81$ or better	
6(a)	27	2		M1 for 3^{3x} seen	
6(b)	3	2		M1 for $7 + 3x = 2^4$	
6(c)	$\frac{x-7}{3}$ oe final answer	2		M1 for $x = 7 + 3y$ or $y - 7 = 3x$ or $-3x = 7 - y$ or $\frac{y}{3} = \frac{7}{3} + x$	
7	5	2		M1 for $a \times (-2)^2 + 1 = 21$	

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8(a)	$5x^3 + 2$ final answer	1			
8(b)	$\frac{x-2}{5}$ final answer	2		M1 for correct first step e.g. $y - 2 = 5x$, $x = 5y + 2$, $\frac{y}{5} = x + \frac{2}{5}$	
9(a)	-17	2		M1 for $f(11)$ seen or $5 - 2(5 - 2x)$ or better	
9(b)(i)	$4x^2 + 8$ oe	1			
9(b)(ii)	$\frac{5-x}{2}$ oe final answer	2		M1 for $x = 5 - 2y$ or $2x = 5 - y$ or $y - 5 = -2x$ or $\frac{y}{2} = \frac{5}{2} - x$	
10(a)	26	2		M1 for $g(5)$ or for $(x^2 + 1)^2 + 1$	
10(b)	$x^2 + 4x + 5$	2		M1 for $(x + 2)^2 + 1$	
10(c)	5	2		M1 for $2x - 3 = 7$	

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10(d)	$\frac{x+3}{2}$ oe	2		M1 for $x = 2y - 3$ or $y + 3 = 2x$ or $\frac{y}{2} = x - \frac{3}{2}$ oe	
11(a)	1	2		M1 for $h(0)$ or for 2^{8-3x}	
11(b)	8	2		M1 for $g(\frac{1}{4})$ or for $\frac{10}{2^x + 1}$	
11(c)	$\frac{10-x}{x}$ or $\frac{10}{x} - 1$ final answer	3		M2 for $x = \frac{10-y}{y}$ or better or $xy = 10 - x$ or better or $y + 1 = \frac{10}{x}$ or M1 for $x(y + 1) = 10$ or $y(x + 1) = 10$ or $x = \frac{10}{y + 1}$ or $x + 1 = \frac{10}{y}$	
11(d)	5	1			
12(a)	[0].70 cao	2		B1 for [0].696 to [0].697	

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12(b)	4 cao	1			
13(a)	2	2		M1 for $f(5)$ or $7 - (7 - x)$ or better	
13(b)	$30 - 4x$ final answer	2		M1 for $4(7 - x) + 2$ or better or for correct answer then spoilt	
13(c)	$15 - 4x^2$ final answer	2		M1 for $15 - (2x)^2$ or better or for correct answer then spoilt	
14(a)	$9x^2$	1			
14(b)	$\frac{x - 5}{3}$	2		M1 for correct first algebraic step e.g. $y - 5 = 3x$ or $\frac{y}{3} = x + \frac{5}{3}$ or better or for interchanging x and y , e.g. $x = 3y + 5$, this does not need to be the first step	
14(c)	$9x + 20$ cao final answer	2		M1 for $3(3x + 5) + 5$	

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15(a)	-13	1			
15(b)	$-3x - 1$ or $5 - 3(x + 2)$	1			
15(c)	$9x - 10$ cao	2		M1 for $5 - 3(5 - 3x)$	
15(d)	$\frac{5 - x}{3}$ final answer oe	2		M1 for correct first step e.g. $y + 3x = 5$ or $\frac{y}{3} = \frac{5}{3} - x$ or $y - 5 = -3x$ or better or for interchanging x and y, e.g. $x = 5 - 3y$, this does not need to be the first step	
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