Question	Answer	Marks	Partial Marks
1(a)	$w-1=\log_5 12$ or $w-1=\frac{\log 12}{\log 5}$	**M1**	
	$w=2.54$ cao	**A1**	
1(b)	Rewrites in quadratic form e.g.: $y=x^{\frac{1}{3}}\quad y^2-5y+6=0$ or $\left(x^{\frac{1}{3}}\right)^2-5x^{\frac{1}{3}}+6=0$	**M1**	
	and factorises or solves e.g. : $(y-2)(y-3)=0$	**M1**	Factorising *their* 3 term quadratic
	$x=8$ and $x=27$	**A1**	
2(a)	$\lg\frac{x^2}{3(x+6)}$ oe, nfww	**B2**	**B1** for any two log laws applied correctly e.g. $\lg\frac{x^2}{x+6}-\lg 3$
2(b)	$\lg\frac{x^2}{3(x+6)}=\lg 1$ or $10^0=\frac{x^2}{3(x+6)}$	**B1**	FT *their* $\lg\frac{x^2}{3(x+6)}$ providing a single logarithm
	$x^2-3x-18=0$	**B1**	**dep** on **B2** in **part (a)**
	Factorises or solves their 3-term quadratic	**M1**	
	$x=6$ indicated as only solution	**A1**	**dep** on **B2** in **part (a)**
3	Valid method to find m $m=\frac{8-1}{9-16}[=-1]$	**M1**	
	Valid method to find c e.g. $1=their(-1)\times 16+c$	**M1**	**FT** *their m*
	$\sqrt[3]{y}=their(-1)x^2+their17$	**A1**	Equation with correct variables and $\sqrt[3]{y}=$
	$y=\left(-x^2+17\right)^3$ oe, isw	**A1**	

Question	Answer	Marks	Partial Marks
4	$27m - 153 + 3n + 6 = 0$ or better	**B1**	
	$-m - 17 - n + 6 = -12$ or better	**B1**	
	Eliminates one unknown for a pair of linear equations in m and n and solves for one unknown	**M1**	
	$m = 6$, $n = -5$	**A2**	**A1** for either
	-24 cao	**A1**	
5(a)(i)	$1 + 4nx + 8n(n-1)x^2$	**B2**	**B1** for any two correct terms or all 3 correct but listed not summed
5(a)(ii)	$8n(n-1) - 16n$	**M1**	**FT** from (i) identifying correct terms and combining *their* coefficient of $x^2 - 4 \times$ *their* coefficient of x
	Solves or factorises *their* 3-term quadratic in n only	**M1**	Forms a 3-term quadratic = 0 and solves except allow '= a constant' if they go on to complete to square
	$n = 29$ only	**A1**	
5(b)	${}^{10}C_2 \times \left(\frac{x}{2}\right)^8 \times \left(-\frac{8}{x^4}\right)^2$ soi	**M1**	Must be clearly identified not in expansion
	11.25 or $\frac{45}{4}$	**A1**	
6(a)(i)	$6 \times 6 \times 5 \times 4 \times 3$ oe	**M1**	
	2160	**A1**	
6(a)(ii)	Full correct calculation (360 + 900) 'how many end with 0'+ 'how many end with 2, 4, 6' oe	**M2**	**M1** for any correct product soi Eg $(6 \times 5 \times 4 \times 3 \times 1)$ or 360 $(5 \times 5 \times 4 \times 3 \times 1)$ or 300 $(5 \times 5 \times 4 \times 3 \times 3)$ or 900
	1260 cao	**A1**	
6(b)	${}^{15}C_7 - {}^{9}C_7$	**M1**	
	6399	**A1**	