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MATHEMATICS

MA01

(9660/MA01) Unit P1 Pure Mathematics

Mark scheme

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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

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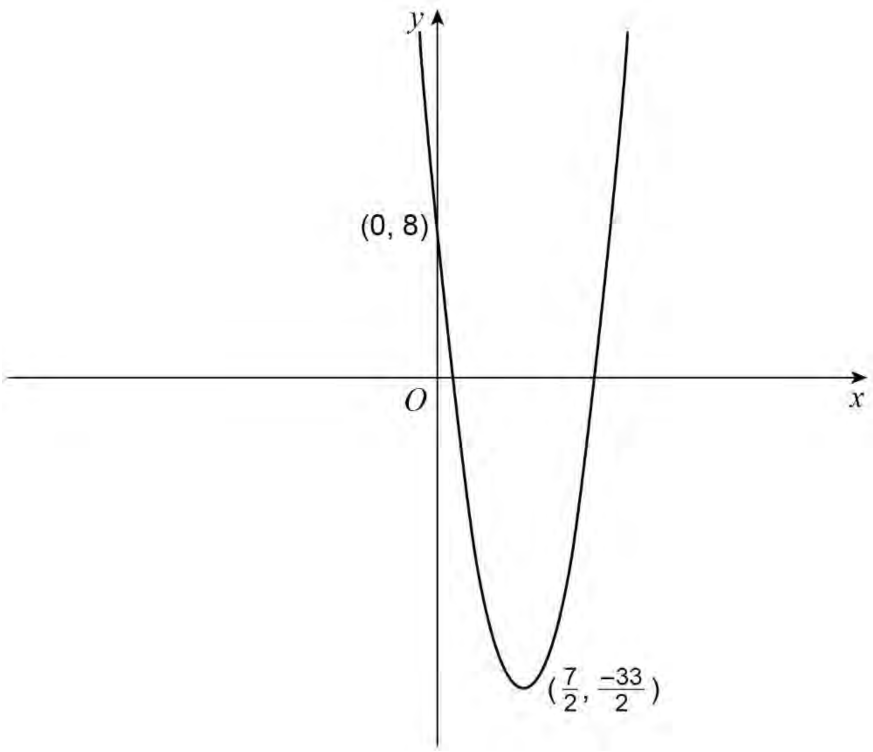
Key to mark scheme abbreviations

M	Mark is for method
m	Mark is dependent on one or more M marks and is for method
A	Mark is dependent on M or m marks and is for accuracy
B	Mark is independent of M or m marks and is for method and accuracy
E	Mark is for explanation
√ **or ft**	Follow through from previous incorrect result
CAO	Correct answer only
CSO	Correct solution only
AWFW	Anything which falls within
AWRT	Anything which rounds to
ACF	Any correct form
AG	Answer given
SC	Special case
oe	Or equivalent
A2, 1	2 or 1 (or 0) accuracy marks
–*x* EE	Deduct *x* marks for each error
NMS	No method shown
PI	Possibly implied
SCA	Substantially correct approach
sf	Significant figure(s)
dp	Decimal place(s)
ISW	Ignore subsequent working

Q	Answer	Marks	Comments
1(a)(i)	$-\frac{7}{2}$	B1	
		1	

Q	Answer	Marks	Comments
1(a)(ii)	$-\frac{33}{2}$	B1	
		1	

Q	Answer	Marks	Comments
1(b)	Correctly orientated symmetrical parabola	B1	
	$(0,8)$ labelled on the y-axis	B1	Condone label given as y-value only.
	Vertex labelled as $\left(\frac{7}{2}, -\frac{33}{2}\right)$	B1ft	**ft** Their $(-a,b)$ from **part (a)** Accept correctly positioned vertex with $x=\frac{7}{2}$ and $y=-\frac{33}{2}$ indicated on axes.



		3	

	Question 1 Total	5	

Q	Answer	Marks	Comments
2(a)	$\left[y=0 \Rightarrow 3x+2\times 0-66=0 \Rightarrow x=22\right]$ $(22, 0)$	B1	Correct coordinates of P Condone only correct x-coordinate given.
		1	

Q	Answer	Marks	Comments
2(b)	$\left[\text{Gradient of } l_1 =\right] -\frac{3}{2}$	M1	**oe** Correct gradient of l_1
	$\left[y=0 \Rightarrow 0=-\frac{3}{2}x-6 \Rightarrow x=-4\right]$ $(-4, 0)$	A1	Correct coordinates of Q Condone only correct x-coordinate given.
		2	

Q	Answer	Marks	Comments
2(c)(i)	$\left[-\frac{3}{2}\times m_{QR}=-1\Rightarrow\right]$		
	$\left[m_{QR}=\right]\frac{2}{3}$	B1	**PI** Correct gradient of *QR* **ft** Their gradient of l_1 and/or l_2 from **part (b)**
	$y-0=\frac{2}{3}\left(x-(-4)\right)$ or $y=\frac{2}{3}x+\frac{8}{3}$	M1	Forms equation of *QR* **ft** Their gradient of *QR* and coordinates of *Q* **ACF**
	$(14,12)$	A2,1	Solves $3x+2y-66=0$ and $y=\frac{2}{3}x+\frac{8}{3}$ simultaneously. Accept $x=14$ and $y=12$ but must be clearly identified **A1**: One correct coordinate **A2**: Correct coordinates
		4	

Q	Answer	Marks	Comments
2(c)(ii)	$\frac{1}{2}\times\left(22-(-4)\right)\times12$	M1	**ft** their coordinates of *P*, *Q* and *R* provided *P* and *Q* are of the form $(x,0)$ **oe** May see $\frac{1}{2}\times\lvert PR\rvert\times\lvert QR\rvert=\frac{1}{2}\times4\sqrt{13}\times6\sqrt{13}$
	$=156$	A1	**CAO**
		2	

	Question 2 Total	**9**	

Q	Answer	Marks	Comments
3(a)	$\frac{8}{p}\sqrt{2p} = k\sqrt{2p} - \frac{12}{\left(\sqrt{2p}\right)^3}$ or $\frac{8}{p}(2p)^{\frac{1}{2}} = k(2p)^{\frac{1}{2}} - 12(2p)^{-\frac{3}{2}}$	M1	Substitutes the coordinates into the equation of the curve. **oe**
	$\frac{16p}{p} = 2kp - \frac{6}{p}$ or $\frac{16p}{p} = 2kp - 12(2p)^{-1}$ or $\frac{16p+6}{p} = 2kp$ or $\frac{8}{p} = k - \frac{12}{4p^2}$ or $32p = 4kp^2 - 12$	M1	Correctly multiplies or divides throughout by $\sqrt{2p}$ or $(2p)^{\frac{1}{2}}$, or multiplies throughout by $(2p)^{\frac{3}{2}}$ Surds or powers must be simplified. **oe**
	$[k =]\frac{8p+3}{p^2}$	A1	**CAO**
		3	

Q	Answer	Marks	Comments
3(b)	$10t^2+27t-28=w\sqrt{5t}-2w$ or $10t^2+27t-28=w\left(\sqrt{5t}-2\right)$	M1	**oe** Isolates terms in w on one side. Condone one error.
	$[w=]\ \dfrac{\left(10t^2+27t-28\right)\left(\sqrt{5t}+2\right)}{\left(\sqrt{5t}-2\right)\left(\sqrt{5t}+2\right)}$	M1	**oe** Divides both sides by $\sqrt{5t}-2$ and multiplies numerator and denominator by $\sqrt{5t}+2$ Denominator may be simplified or unsimplified.
	$[w=]\ \dfrac{(5t-4)(2t+7)\left(\sqrt{5t}+2\right)}{5t-4}$	M1	Factorises $10t^2+27t-28$ correctly in their expression. Accept denominator not expanded. **PI** by correct final answer but **M1M1** must have been awarded.
	$[w=]\ (2t+7)\left(\sqrt{5t}+2\right)$	A1	Must be convincingly shown. **CAO**
3(b) ALT	$10t^2+27t-28=w\sqrt{5t}-2w$ or $10t^2+27t-28=w\left(\sqrt{5t}-2\right)$	M1	**oe** Isolates terms in w on one side.
	$(5t-4)(2t+7)=w\left(\sqrt{5t}-2\right)$	M1	**oe** Factorises LHS correctly in their equation.
	$\left(\sqrt{5t}-2\right)\left(\sqrt{5t}+2\right)(2t+7)=w\left(\sqrt{5t}-2\right)$ or $[w=]\ \dfrac{\left(\sqrt{5t}-2\right)\left(\sqrt{5t}+2\right)(2t+7)}{\left(\sqrt{5t}-2\right)}$	M1	**oe** Factorises $(5t-4)$ **PI** by correct final answer but **M1M1** must have been awarded.
	$[w=]\ (2t+7)\left(\sqrt{5t}+2\right)$	A1	Must be convincingly shown. **CAO**
		4	

	Question 3 Total	7	

Q	Answer	Marks	Comments
4(a)	$[u_2 =]\ k-9$ or $[u_3 =]\ k-\frac{18}{k-9}$ or $[u_3 =]\ 5k-54$	B1	**oe** Correct expression for u_2 or u_3 in terms of k Simplified or unsimplified.
	$k-\frac{18}{k-9}=5(k-9)-9$ or $k(k-9)-18=5(k-9)(k-9)-9(k-9)$ or $k(k-9)-18=(5k-54)(k-9)$ or $k^2-9k-18=5k^2-99k+486$	M1	**oe** Expressions for u_2 and u_3 correctly substituted into $u_3=5u_2-9$
	$4k^2-90k+504=0$ or $2k^2-45k+252=0$	M1	Forms a correct quadratic equation set equal to zero **oe**, such as $4(k-9)^2-18(k-9)+18=0$ **PI** By both correct values of k
	$(2k-21)(k-12)=0$ and $k=12$	A1	**PI** By both correct values of k **oe** Correct factorisation, such as $((k-9)-3)(4(k-9)-6)=0$, and $k=12$ stated May see substitution into the quadratic formula simplified or unsimplified but must be correct
	$k=\frac{21}{2}$	A1	**ACF**
		5	

Q	Answer	Marks	Comments
4(b)	$\left[u_3=12-\frac{18}{12-9}=\right]$ 6	B1	Correct value for u_3 **PI** by correct value for u_4
	$\left[u_4=12-\frac{18}{6}=\right]$ 9	B1	
		2	

	Question 4 Total	**7**	

Q	Answer	Marks	Comments
5(a)	$\frac{1}{6}d\times\left(-\frac{1}{4}d\right)\times\left(-\frac{1}{4}d\right)=18$	M1	**oe** Uses x-coordinates of x-intercepts with or without signs completely reversed, and set equal to 18 **PI** by $\frac{1}{96}d^3=18$ or $d^3=1728$ or $d=\sqrt[3]{1728}$
	$\frac{1}{96}d^3=18$ or $d^3=1728$ or $d=\sqrt[3]{1728}$ and $d=12$	A1	**oe** **AG**
		2	

Q	Answer	Marks	Comments
5(b)	$[\mathrm{f}(x)=]\ (x+2)(x-3)(x-3)$ or $[\mathrm{f}(x)=]\ (x+2)(x-3)^2$	M1	Product of three linear factors with two correct.
	$[\mathrm{f}(x)=]\ (x+2)(x^2-6x+9)$ or $[\mathrm{f}(x)=]\ (x-3)(x^2-x-6)$	M1	Product of a linear and a quadratic factor **ft** Their product of three linear factors
	$[\mathrm{f}(x)=]\ x^3-6x^2+9x+2x^2-12x+18$ or $[\mathrm{f}(x)=]\ x^3-x^2-6x-3x^2+3x+18$ and $\mathrm{f}(x)=x^3-4x^2-3x+18$	A1	**CAO** **oe** Further line of working with brackets expanded before **AG** **SC1** for setting up correct simultaneous equations in b and c using values of intercepts.
		3	

Q	Answer	Marks	Comments
5(c)	$[f(x-5)-3 \Rightarrow]$ $y+3=(x-5)^3-4(x-5)^2-3(x-5)+18$ or $y+3=(x-3)(x-8)(x-8)$	M1	**oe** Substitutes $(y+3)$ for y and $(x-5)$ for x into $y=f(x)$ simplified or unsimplified
		M1	Three correct terms in a simplified four-term expression
	$[y=g(x)=]\ x^3-19x^2+112x-195$	A1	**CAO**
		3	

Q	Answer	Marks	Comments
5(d)	$[g(5)=]\ 5^3-19\times5^2+112\times5-195\ [=15]$ or $[g(5)=]\ 125-475+560-195\ [=15]$	M1	**ft** Their $g(x)$ from **part (c)** Substitutes $x=5$ into $g(x)$
	$[g(5)=]\ 15$ so $(x-5)$ is not a factor	A1ft	**ft** Their $g(x)$ from **part (c)** $g(5)$ correctly evaluated for their $g(x)$ and correct concluding statement based on their value of $g(5)$
		2	

	Question 5 Total	**10**	

Q	Answer	Marks	Comments
6(a)	$\frac{x}{8}=\frac{6}{y}$ or $\frac{x+6}{y+8}=\frac{x}{8}$ or $\frac{x+6}{y+8}=\frac{6}{y}$ or $xy=48$ or $[y=]\frac{48}{x}$ or $\frac{x}{6}=\frac{8}{y}$	B1	**oe** Finds relationship between x and y
	$[T=]\ 48+4x+3y$ or $[T=]\ \frac{1}{2}(x+6)(y+8)$ or $[T=]\ \frac{1}{2}(xy+8x+6y+48)$ or $[T=]\ \frac{1}{2}xy+4x+3y+24$	M1	**oe** Forms an expression for the area of the triangle.
	$48+4x+3\times\frac{48}{x}$ or $24+\frac{144}{x}+4x+24$ or $[T=]\ \frac{1}{2}\left(48+8x+6\times\frac{48}{x}+48\right)$ or $[T=]\ \frac{1}{2}\times 48+4x+3\times\frac{48}{x}+24$ and $T=48+4x+\frac{144}{x}$	A1	**oe** Extra line of working with 'y's eliminated and **AG** Be convinced.
		3	

Q	Answer	Marks	Comments
6(b)(i)	$\left[\frac{\mathrm{d}T}{\mathrm{d}x}=\right]\ 4-\frac{144}{x^2}$	**B1**	**oe** Correct derivative
	$4-\frac{144}{x^2}=0$	**M1**	Sets their derivative to equal zero
	$[x=]\ 6$	**A1**	**CAO** Ignore $x=-6$ if seen
	$\left[x=6 \Rightarrow T=48+4\times6+\frac{144}{6}=\right]\ 96$	**A1**	**CAO**
		4	

Q	Answer	Marks	Comments
6(b)(ii)	$\left[\frac{\mathrm{d}^2T}{\mathrm{d}x^2}=\right]\ \frac{288}{x^3}$	**B1ft**	**oe** **ft** their first derivative from **part (b)(i)** and second derivative must be of the form $\frac{k}{x^3}$ where $k>0$
	$\left[x=6 \Rightarrow \frac{\mathrm{d}^2T}{\mathrm{d}x^2}=\right]\ \frac{288}{6^3}\ \left[=\frac{288}{216}=\frac{4}{3}\right]$ and since $\frac{\mathrm{d}^2T}{\mathrm{d}x^2}>0$ it is a minimum value of T	**E1ft**	$x=6$ substituted into their second derivative and concluding statement made. **ft** their value of x provided it is positive Second derivative must be of the form $\frac{a}{x^3}$ **oe**.
		2	

	Question 6 Total	**9**	

Q	Answer	Marks	Comments
7(a)	$\left[\frac{\mathrm{d}y}{\mathrm{d}x}=\right]\ 4-\frac{1}{2}x$	B1	Correct derivative
	$\left[x=4 \Rightarrow \frac{\mathrm{d}y}{\mathrm{d}x}=\right]\ 2$	B1	Correct gradient of l
	$y-24=2(x-5)$ or $[y=]2x+14$	M1	**ACF** Forms a correct equation for l
	$35+4x-\frac{1}{4}x^2=2x+14$	M1	**ft** Their expression for y in terms of x **oe** Eliminates y
	$\frac{1}{4}x^2-2x-21=0$ and $x^2-8x-84=0$	A1	**oe** Must see a second line of working before **AG**
		5	

Q	Answer	Marks	Comments
7(b)	$[x=]-6$ and $[x=]\ 14$	B1	Correct critical values
	$-6<x<14$	B1	**CAO** Accept interval notation $(6,14)$ but not $[6,14]$.
		2	

Q	Answer	Marks	Comments
7(c)(i)	$\left[\int\left(35+4x-\frac{1}{4}x^2\right)\mathrm{d}x=\right]$ $35x+2x^2-\frac{1}{12}x^3+c$	B2,1	**oe** **B1** At least two correct terms in the integration **B2** Fully correct integration with $'+c'$
		2	

Q	Answer	Marks	Comments
7(c)(ii)	$\left[\int_{-6}^{14}\left(35+4x-\frac{1}{4}x^2\right)\mathrm{d}x=\right]$ $\left(35\times14+2\times14^2-\frac{1}{12}\times14^3\right)$ $-\left(35\times(-6)+2\times(-6)^2-\frac{1}{12}\times(-6)^3\right)$	M1	**ft** their limits from **part (b)** Correct substitution into their integral from **part (c)(i)** May be partially evaluated **PI**
	$\frac{2320}{3}$ or $773\frac{1}{3}$	A1	Correct value for definite integral If given as decimal **AWRT** 773 **PI** by correct final answer.
	$\left[x=-6\Rightarrow y=35+4(-6)-\frac{1}{4}(-6)^2=\right]$ 2 and $\left[x=14\Rightarrow y=35+4(14)-\frac{1}{4}(14)^2=\right]$ 42	B1	Correct y-coordinates of P and Q **PI** Could be implied by integral with limits eg $\int_{-6}^{14}2x+14\mathrm{d}x$
	$\frac{2320}{3}-\frac{1}{2}(2+42)\times20$ or $\frac{2320}{3}-440$	M1	**oe** **ft** their value for the definite integral but must have correct area of the trapezium simplified or unsimplified. **PI**
	$\frac{1000}{3}$ or $333\frac{1}{3}$	A1	Correct value for required area If given as decimal **AWRT** 333.33 **NMS** scores zero.
		5	

Q	Answer	Marks	Comments
7(c)(ii) ALT	$\int_{-6}^{14}\left(35+4x-\frac{1}{4}x^2\right)-(2x+14)\,\mathrm{d}x$ $\int_{-6}^{14}\left(21+2x-\frac{1}{4}x^2\right)\mathrm{d}x$	**M1**	Sets up a single integral **PI** by correct final answer.
	$\left[21x+x^2-\frac{1}{12}x^3\right]_{[-6]}^{[14]}$	**M1** **A1**	Correct integration at least two terms correct. All correct. **PI**
	$[\mathrm{F}(14)-\mathrm{F}(-6)=]\frac{784}{3}-(-72)$	**M1**	Correct substitution. Simplified or unsimplified. **PI**
	$\frac{1000}{3}$ or $333\frac{1}{3}$	**A1**	Correct value for required area If given as decimal **AWRT** 333.33 **NMS** scores zero.
		5	

	Question 7 Total	**14**	

Q	Answer	Marks	Comments
8(a)	$\left[(1-w)^3=\right]\ 1-3w+3w^2-w^3$	B1	
		1	

Q	Answer	Marks	Comments
8(b)	$\left[\left(1-\sqrt{x}\right)^3=\right]\ 1-3\sqrt{x}+3\left(\sqrt{x}\right)^2-\left(\sqrt{x}\right)^3$ $=1-3\sqrt{x}+3x-x\sqrt{x}$ or $\left[\left(1+\sqrt{x}\right)^3=\right]\ 1-3\left(-\sqrt{x}\right)+3\left(-\sqrt{x}\right)^2-\left(-\sqrt{x}\right)^3$ $=1+3\sqrt{x}+3x+x\sqrt{x}$	B1ft	**ft** their answer to **part (a)** **PI oe** Correct expansion of $\left(1-\sqrt{x}\right)^3$ or $\left(1+\sqrt{x}\right)^3$ or $(1+w)^3$ simplified or unsimplified.
	$4\left(1-3\sqrt{x}+3x-x\sqrt{x}\right)+1+3\sqrt{x}+3x+x\sqrt{x}$ or $4-12\sqrt{x}+12x-4x\sqrt{x}+1+3\sqrt{x}+3x+x\sqrt{x}$	M1	**PI oe** Substitutes their expansions into $4\left(1-\sqrt{x}\right)^3+\left(1+\sqrt{x}\right)^3$
	$5-9\sqrt{x}+15x-3x\sqrt{x}$	A2,1	Must be expression in the correct form. **A1** for a or b correct. **A2** for a and b both correct.
		4	

Q	Answer	Marks	Comments
8(c)	$5-9x^{\frac{1}{2}}+15x-3x^{\frac{3}{2}}$	B1ft	**PI ft** their answer to **part (b)** Correctly rewrites integrand as powers of x
	$\left[\int\left(5-9x^{\frac{1}{2}}+15x-3x^{\frac{3}{2}}\right)\mathrm{d}x=\right]$		
	$5x-\frac{2}{3}\times 9x^{\frac{3}{2}}+\frac{15}{2}x^2-\frac{2}{5}\times 3x^{\frac{5}{2}}\ [+c]$ or $5x-6x^{\frac{3}{2}}+\frac{15}{2}x^2-\frac{6}{5}x^{\frac{5}{2}}\ [+c]$	M1 A1ft	**ft** their integrand. **M1**: At least one term with fractional power correctly integrated, simplified or unsimplified. **A1ft**: Fully correct integration with simplified coefficients using their integrand.
	$5\times 4-6\times 4^{\frac{3}{2}}+\frac{15}{2}\times 4^2-\frac{6}{5}\times 4^{\frac{5}{2}}+c=20$ or $20-48+120-\frac{192}{5}+c=20$	M1	**oe** Substitutes $x=4$ into their integral and sets it equal to 20 Must have $'+c'$ at this stage. **PI** by $c=-\frac{168}{5}$ or $c=-33.6$
	$y=5x-6x^{\frac{3}{2}}+\frac{15}{2}x^2-\frac{6}{5}x^{\frac{5}{2}}-\frac{168}{5}$	A1	**ACF** With simplified coefficients.
		5	

	Question 8 Total	**10**	

Q	Answer	Marks	Comments
9(a)	$\left[\frac{u_2}{u_1}=\frac{u_3}{u_2}\Rightarrow\right]\frac{b}{a}=\frac{c}{b}$	M1	**PI oe** Forms a correct equation relating a, b and c
	$\left[b^2=ac\Rightarrow\left(27c^2\right)^2=ac\Rightarrow c^4=\frac{ac}{729}\Rightarrow\right]$ $\left[c^3=\right]\frac{a}{729}$ or $\left[c=\right]\frac{a^{\frac{1}{3}}}{9}$ or $729c^3=a$ or $9c=a^{\frac{1}{3}}$	M1	**oe** Uses $b^2=ac$ to form an expression for c^3 or c or an equation in terms of a and c
	$\left[b^2=ac\Rightarrow b^2=\right]\frac{a^{\frac{4}{3}}}{9}$	M1	**oe** Simplified or unsimplified. Uses $b^2=ac$ and eliminates c **PI** by correct unsimplified final answer.
	$\left[b=\right]\frac{a^{\frac{2}{3}}}{3}$	A1	**oe** Must be simplified Allow $u_2=\frac{a^{\frac{2}{3}}}{3}$ and $u_2=\frac{\sqrt[3]{a^2}}{3}$
		4	

Q	Answer	Marks	Comments
9(a) ALT	$\left[\frac{u_2}{u_1}=\frac{u_3}{u_2}\Rightarrow\right]\ \frac{b}{a}=\frac{c}{b}$	M1	**PI oe** Forms a correct equation relating a, b and c
	$\left[b^2=ac\Rightarrow c=\frac{b^2}{a}\Rightarrow\right]$ $b=27\left(\frac{b^2}{a}\right)^2$ or $b=\frac{27b^4}{a^2}$	M1	**PI oe** Uses $b^2=ac$ to eliminate c in $b=27c^2$
	$\left[b^3=\right]\ \frac{a^2}{27}$	M1	**oe** Correct expression for b^3 in terms of a **PI** by correct unsimplified final answer.
	$[b=]\ \frac{a^{\frac{2}{3}}}{3}$	A1	**oe** Must be simplified. Allow $u_2=\frac{a^{\frac{2}{3}}}{3}$ and $u_2=\frac{\sqrt[3]{a^2}}{3}$
		4	

Q	Answer	Marks	Comments
9(b)	$\left[\dfrac{5-4\times(-3)^{n-1}}{k^n}=\right]\ \dfrac{5}{k^n}-\dfrac{4\times(-3)^{n-1}}{k^n}$	M1	**PI** Writes as correct difference of two fractions
	$\left[\dfrac{5}{k^n}\Rightarrow\dfrac{5}{k},\dfrac{5}{k^2},\dfrac{5}{k^3}\ldots\right]\ a=\dfrac{5}{k},\ r=\dfrac{1}{k}$ or $\left[\dfrac{4\times(-3)^{n-1}}{k^n}\Rightarrow\dfrac{4}{k},\dfrac{-12}{k^2},\dfrac{36}{k^3}\ldots\right]\ a=\dfrac{4}{k},\ r=\dfrac{-3}{k}$	M1	Deduces that $\dfrac{5}{k^n}$ or $\dfrac{4\times(-3)^{n-1}}{k^n}$ describes a geometric sequence and gives the correct corresponding first term and common ratio **PI** by term equivalent to either $\dfrac{5}{k-1}$ or $-\dfrac{4}{k+3}$
	$\left[\sum_{n=1}^{\infty}\dfrac{5-4\times(-3)^{n-1}}{k^n}=\sum_{n=1}^{\infty}\dfrac{5}{k^n}-\sum_{n=1}^{\infty}\dfrac{4\times(-3)^{n-1}}{k^n}=\right]$ $\dfrac{\frac{5}{k}}{1-\frac{1}{k}}-\dfrac{\frac{4}{k}}{1-\left(-\frac{3}{k}\right)}$	M1	**oe** Uses the formula for the sum to infinity and correctly substitutes the correct first terms and common ratios
	$\dfrac{5}{k-1}-\dfrac{4}{k+3}$ or $\dfrac{5(k+3)-4(k-1)}{(k-1)(k+3)}$	M1	Fractions eliminated from numerators and denominators Must be correct at this stage
	$\dfrac{k+19}{(k-1)(k+3)}$ or $\dfrac{k+19}{(k+3)(k-1)}$	A1	**CAO** In correct form
		5	

	Question 9 Total	9	