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Mark Scheme (Results)

January 2022

Pearson Edexcel International GCSE
In Mathematics B (4MB1)
Paper 01

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January 2022
Question Paper Log Number P68816A
Publications Code 4MB1_01_2201_MS
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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.
  Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

- **Types of mark**
  - M marks: method marks
  - A marks: accuracy marks
  - B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
  - cao – correct answer only
  - ft – follow through
  - isw – ignore subsequent working
  - SC - special case
  - oe – or equivalent (and appropriate)
  - dep – dependent
  - indep – independent
  - awrt – answer which rounds to
  - eeoo – each error or omission
- **No working**
  If no working is shown then correct answers normally score full marks
  If no working is shown then incorrect (even though nearly correct) answers score no marks.

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- **With working**

  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

  If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

  If a candidate misreads a number from the question: eg. Uses 252 instead of 255; method marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

  If there is a choice of methods shown, mark the method that leads to the answer on the answer line; where no answer is given on the answer line, award the lowest mark from the methods shown.

  If there is no answer on the answer line then check the working for an obvious answer.

- **Ignoring subsequent work**

  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded to another.

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<table>
<tr><th>Question</th><th>Working</th><th>Answer</th><th>Mark</th><th colspan="2">Notes</th></tr>
<tr><td>1</td><td>$180 = 2\times2\times3\times3\times5$
$198 = 2\times3\times3\times11$
or
<table><tr><td>2</td><td>180</td><td>198</td></tr><tr><td>3</td><td>90</td><td>99</td></tr><tr><td>3</td><td>30</td><td>33</td></tr><tr><td>2</td><td>10</td><td>11</td></tr><tr><td>5</td><td>5</td><td>11</td></tr><tr><td>11</td><td>1</td><td>11</td></tr><tr><td></td><td>1</td><td>1</td></tr></table></td><td></td><td>2</td><td>M1</td><td>A correct method to enable the LCM to be found.
Correct factorisation of 180 and 198 allow on factor trees.
For the table they must divide both numbers by those shaded (or other combination with a product of 18) in grey at some point. All other lines are optional but must be correct if seen (2 and 5 could be combined to give 10).
Division could be in a different order.
Allow list of multiples – at least 5 correct for each number, excluding 180 and 198 eg.
360,540,720,900,1080 and 396, 594, 792, 990,1188</td></tr>
<tr><td></td><td></td><td>1980</td><td></td><td>A1</td><td>Allow $2^2\times3^2\times5\times11$</td></tr>
<tr><td colspan="6">Total 2 marks</td></tr>
<tr><td>2</td><td>$3p\left(2p^2q^5r-5q^3\right)$ or $3q^3\left(2p^3q^2r-5p\right)$ or $pq^3\left(6p^2q^2r-15\right)$ or $3pq\left(2p^2q^4r-5q^2\right)$ or $3pq^2\left(2p^2q^3r-5q\right)$ or $3pq^3$(a 2 term algebraic expression)</td><td></td><td>2</td><td>M1</td><td></td></tr>
<tr><td></td><td></td><td>$3pq^3\left(2p^2q^2r-5\right)$</td><td></td><td>A1</td><td>cao</td></tr>
<tr><td colspan="6">Total 2 marks</td></tr>
<tr><td>3</td><td>$\frac{11-2\times(-2)^2}{-3}$ oe</td><td></td><td>2</td><td>M1</td><td>Allow $\frac{11-2\times(2)^2}{-3}$ or $\frac{11-2\times4}{-3}$ or $\frac{11-2(-2)^2}{-3}$</td></tr>
<tr><td></td><td></td><td>– 1</td><td></td><td>A1</td><td>cao</td></tr>
<tr><td colspan="6">Total 2 marks</td></tr>
</table>

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Question	Working	Answer	Mark	Notes
4	$\cos\angle ABC = \frac{8}{15}$		2	M1 Correct expression for trigonometric ratio of $\angle ABC$ Allow use of Pythagoras with tan or sine. Allow use of sine rule or cosine rule. Eg. $[AC =]\sqrt{15^2 - 8^2}\ [=12.7]$ and $\frac{\sin\angle ABC}{"12.7"} = \frac{\sin 90}{15}$
		57.8		A1 awrt 57.8
				Total 2 marks
5	$\begin{pmatrix} 20 & -16 \\ 8 & -8 \end{pmatrix}[-]\begin{pmatrix} 9 & -6 \\ -6 & 15 \end{pmatrix}$		2	M1 Multiplying by scalar. Allow 1 numerical or sign error. There is no need to show an intention to subtract.
		$\begin{pmatrix} 11 & -10 \\ 14 & -23 \end{pmatrix}$		A1 cao
				Total 2 marks
6 (a)		$-2, 1$	1	B1 cao
(b)	$3m - 5 = 103$ oe			M1 Forms an equation or a method to find m eg. $[m =]\frac{(103-(-2))}{3} + 1$ allow use of alternative letters
		36	2	A1 cao
				Total 3 marks

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Question	Working	Answer	Mark	Notes
7	Gradient = $\frac{8-(-6)}{4-0}\left[=3.5\right]$ oe		3	M1 An expression to find *m* or equation involving *m* only eg. 8 = 4*m* – 6
	$y="3.5"x...$ or $y=...x-6$			M1 Accept an equation with a gradient of "3.5" or *y*-intercept of –6 in any form eg. *y* – 8 = "3.5"(*x* – 4) If ft gradient previous M mark must be scored.
		$y=3.5x-6$		A1 oe accept any simplified form with a unitary coefficient of *y* eg $y+6=3.5x$ Allow any equivalent fraction for 3.5. Allow $2y=7x-12$ if $y=3.5x-6$ or $y+6=3.5x$ seen in working, otherwise do not isw
				Total 3 marks
8	$\frac{55}{360}\times 2\times\pi\times 6.5\left[=\frac{143\pi}{72}=6.239...\right]$		3	M1 Correct method to find the length of arc *AB*
	"6.239..."$+2\times 6.5$			M1 dep add on the 2 straight edges
		19.2		A1 awrt 19.2 accept $\frac{143\pi}{72}+13$
				Total 3 marks

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Question	Working	Answer	Mark	Notes
9	$125x^6y^3$		3	M1 Two terms correct as part of a product. Expect to see as the numerator of a fraction but allow separately. Allow 5^3 for 125
	kx^ay^b			M1 dep Must gain the previous M mark if not fully correct. Must be seen as a single expression involving a product of 3 terms. 2 of $k = 5$, $a =$ "6"– 3 and $b = 3$ correct, seen k may be a fraction
		$5x^3y^3$		A1
				Total 3 marks
10	$AD = BC$ and $\angle BAD = \angle ABC$ are given		3	B1 Accept $AD = BC$ and $\angle BAD = \angle ABC$ stated just marking on the diagram is not sufficient
	AB is a common side			M1 Accept $AB = AB$
		[ABC and BAD are congruent] by SAS $AC = BD$		A1 Correct conclusion with no incorrect statements. Allow a fully correct statement of the cosine rule for each triangle and a conclusion as equivalent to SAS. To award the mark in this instance both previous marks need to be awarded.
				Total 3 marks
11	$\frac{1}{3}\pi\times9^2\times24\left[=648\pi=2036\right]$ **or** $\frac{2}{3}\pi\times9^3\left[=486\pi=1527\right]$		3	M1 Volume of cone or hemisphere accept value correct to 3sf.
	$\frac{1}{3}\pi\times9^2\times24+\frac{2}{3}\pi\times9^3$			M1 dep Sum of correct volumes (accept awrt 3560 to 3sf.)
		1134π		A1 cao
				Total 3 marks

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Question	Working	Answer	Mark	Notes
12	$y = x + 1 + x^{-1}$		3	M1 Rewriting as a 3 term expression in a form that can be differentiated. At least 2 terms correct. Allow product or quotient rule with a maximum of 1 error: $\left[\frac{dy}{dx} =\right] (2x+1)x^{-1} - (x^2+x+1)x^{-2}$ or $\left[\frac{dy}{dx} =\right] \frac{(2x+1)x - (x^2+x+1)[1]}{x^2}$
	$\left[\frac{d(x)}{dx} =\right] 1$ or $\left[\frac{d(x^{-1})}{dx} =\right] -x^{-2}$			M1 indep For one term in x correctly differentiated (ft their simplified 3 term expression) or one correct derivative in a product or quotient rule $(2x+1)$, 1 or $-x^{-2}$, **must have the correct structure for the rule**
		$1 - x^{-2}$		A1 oe Allow an unsimplified answer, do not isw **SC** if no other marks awarded if top and bottom are differentiated independently giving an answer of $2x+1$ award B1
				Total 3 marks
13	$\sqrt{144 \times 3} - \sqrt{49 \times 3}$		3	M1 Must see 432 and 147 decomposed into at least 144×3 and 49×3
	$5\sqrt{3}$			A1 Must gain the method mark to award this allow for $\sqrt{75}$ gained without $5\sqrt{3}$ stated
		$\sqrt{75}$		A1 dep on M mark gained allow $n = 75$
				Total 3 marks

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Question	Working	Answer	Mark	Notes
14	$\sqrt[3]{\frac{32}{500}\left[=\frac{8}{125}=0.064\right]}\left[=\frac{2}{5}\right]$ or $\sqrt[3]{\frac{500}{32}\left[=\frac{125}{8}=15.625\right]}\left[=\frac{5}{2}\right]$ or $\left(\frac{250}{x}\right)^3=\left(\frac{500}{32}\right)^2$ oe		3	M1 An expression to find a linear scale factor or a correct equation in x^3. Also accept $\left(\frac{x}{250}\right)^3=\left(\frac{500}{32}\right)^2$ for this mark only.
	$250\times"0.4"^2$ or $250\div"2.5"^2$ or $\left[x=\right]\sqrt[3]{250^3\times\left(\frac{32}{500}\right)^2}$ oe			M1 dep A fully correct expression for the surface area
		40		A1 cao
				Total 3 marks
15(a)	$18\times8+20\times3+21.5\times15+22.5\times8+24\times6$ $\left[=144+60+322.5+180+144=850.5\right]$		3	M1 for *fx* calculated for at least 4 class intervals where *x* is a number in the range including the upper bound and an attempt to sum.
	$\frac{"850.5"}{\left[8+3+15+8+6=\right]40}$			M1 dep dividing their total for *fx* by their total for *f*
		21.3		A1 awrt 21.3
(b)		$\frac{26}{40}$	1	B1 oe $\left(\frac{13}{20}\right.$ and 0.65 often seen$\left.\right)$ ft their 40 if it comes from 8 + 3 + 15 + 8 + 6
				Total 4 marks

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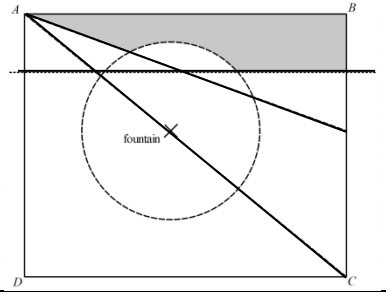
Question	Working	Answer	Mark	Notes
16(a)	$21\,250 \times 1.04$ oe	22 100 shown	1	B1 increasing 21 250 by 4%.
(b)	$22\,100 - 4000 [= 18\,100]$		3	Accept $22\,100 - 8000 [= 14\,100]$ for this mark only. M1 Need to see subtraction of 4000 before an attempt at adding interest
	$(22\,100 - 4000) \times 1.04 - 4000$			M1 dep full method to find final amount
		14 824		A1 Do not isw
				Total 4 marks
17			4	
	A line parallel to *AB* drawn 2cm from *AB*			M1
	Circle radius 3cm centre the fountain			M1 Allow gaps in circle as long they are below any line drawn parallel to *AB*
	AC drawn and arc on *AB* and *AC* equal distance from *A* plus two intersecting arcs drawn from these plus line drawn			M1 Allow if *AC* not complete as long as sufficient is drawn to allow the required construction use professional judgement on the accuracy of *AC*
		Correct region identified		A1 dep All previous method marks must be awarded. Condone if the region is not labelled R as long as it is clearly shaded.
				Total 4 marks

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Question	Working	Answer	Mark	Notes		
18	$[29.4 =]\frac{1}{2}(9+5)\times BC$ oe		4	M1	for correct formula for area of the trapezium. Allow for a correct equation in *BC*. Allow *h* or *x* for *BC*. Do not allow *AD*.	
	$[BC =]\frac{29.4\times 2}{14}[=4.2]$			M1	dep a correct expression for *BC*	
	$AD^2 = "4.2"^2 + (9-5)^2$ oe			M1	indep A correct formula involving *AD* ft their *BC*	
		5.8		A1	cao	
						Total 4 marks
19	$180(n-2) = 8280$ oe		4	M1	Forming a correct equation.	
	$n = \frac{8280}{180} + 2[=48]$			M1	dep Rearranging correctly to find *n* (number of sides).	
	$\frac{360}{"48"}$ or $180 - \frac{8280}{"48"}$			M1	indep Correct method to find exterior angle from their *n*. For the award of this mark *n* must be a positive integer.	
		7.5		A1	cao	
						Total 4 marks
20	$p = \frac{k}{\sqrt{q}}$		4	M1	For using inversely proportional e.g. $p = \frac{k}{...}$ or $k = p \times \ldots$	M2 correct equation in *q* eg $28\sqrt{q} = 420\times\sqrt{9}$
	$k = 420\times\sqrt{9}[=1260]$			M1	dep Substitute numbers into their equation to find a correct expression for *k*.	
	$q = \left(\frac{"1260"}{28}\right)^2$			M1	dep Rearranging correctly to get a value for *q*.	
		2025		A1	cao	
						Total 4 marks

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Question	Working	Answer	Mark	Notes
21	$12.5 \leqslant \text{Area} < 13.5$ $5.15 \leqslant a < 5.25$ $8.35 \leqslant b < 8.45$		4	M1 One bound from each line seen e.g. 12.5 , 5.15 and 8.45 seen
	$[\sin C =]\dfrac{2\times\text{Area}}{a\times b}$ or $\text{Area} = \dfrac{1}{2}\times a\times b\times\sin C$			M1 Expression to find sin *C* **with values substituted in**. If values of Area, *a* and *b* not clearly defined in response allow $10 \leq \text{Area} \leq 20$, $5 \leq a \leq 6$ and $8 \leq b \leq 9$ sin *C* = is not required but penalise incorrect formula used.
	$= \dfrac{2\times 12.5}{5.25\times 8.45}$ or $12.5 = \dfrac{1}{2}\times 5.25\times 8.45\times\sin C$			M1 Dep on previous M mark. Must show 1 LB for Area and 2 UB for *a* and *b* if these are not clearly stated allow use of $12.5 \leqslant \text{Area} < 13$, $5.2 < a \leqslant 5.25$ $8.4 < b \leqslant 8.45$
		34.3		A1 Awrt 34.3 must see all correct values (12.5, 5.25 and 8.45) used
				Total 4 marks

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Question	Working	Answer	Mark	Notes
22	$\dfrac{8-7x}{(6x-5)(x+2)}$		4	M1 denominator factorised, must expand to give at least 2 term correct
	$\dfrac{3(x+2)-2(5x-1)}{(x+2)(5x-1)}$ or $\dfrac{(x+2)(5x-1)}{3(x+2)-2(5x-1)}$ oe			M1 indep 2 fractions subtracted, allow 1 sign error eg. $\dfrac{3x+6-10x-2}{5x^2+10x-x-2}$
	$\left[\dfrac{8-7x}{(6x-5)(x+2)}\right]\times\dfrac{(x+2)(5x-1)}{8-7x}$			M1 indep this is not dependent on the previous marks but the candidate must achieve a single fraction from their subtraction to be awarded this mark for inverting their divisor.
		$\dfrac{5x-1}{6x-5}$		A1 dep on all M marks awarded correct answer gained with no incorrect working seen.
				Total 4 marks

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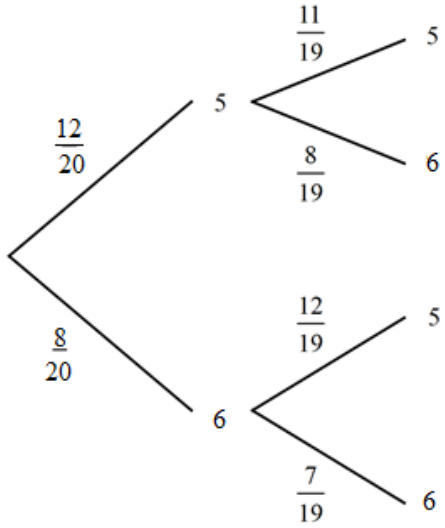
Question	Working	Answer	Mark	Notes	
23 (a)			3	B1 8/20 oe B1 11/19 and 8/19 B1 12/19 and 7/19	
(b)	$\frac{12}{20}\times"\frac{8}{19}"$ or $\frac{8}{20}\times"\frac{12}{19}"$ or $\frac{8}{20}\times"\frac{7}{19}"$ oe		3	M1 ft their (a) (Do not ft values greater than 1) One correct probability.	M2 for $1-\frac{12}{20}\times"\frac{11}{19}"$
	$\frac{12}{20}\times"\frac{8}{19}"+\frac{8}{20}\times"\frac{12}{19}"+\frac{8}{20}\times"\frac{7}{19}"$ oe			M1 ft their (a) (Do not ft values greater than 1) Recognising the 3 combinations and adding them oe eg $\frac{12}{20}\times"\frac{8}{19}"+"\frac{8}{20}"$	
		$\frac{62}{95}$		A1 oe allow awrt 0.653	
					Total 6 marks

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Question	Working	Answer	Mark	Notes
24	$[M =]10p+q$ or $[N =]10q+p$ stated or used		5	M1 Allow M and N interchanged as long as one is $10p + q$ and one is $10q + p$ or $M+N=10p+10q+p+q$ oe
	$"10q+p"-("10p+q")=9$ or $q-p=1$ oe			M1 dep or $M+N=11\times13$
	$p=6$ or $q=7$			A1 $M+N=143$
	e.g. $q-6=1$			M1 dep on first two M marks. Method to find second unknown or M eg. $2M=143+9$ If p or q is not an integer between 0 and 9 inclusive do not award this mark if used to find the other digit. Can be implied by a correct answer if all other marks awarded
		67		A1 dep on all marks gained
				Total 5 marks

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Question	Working	Answer	Mark	Notes
25	$8(x^2-7x)+17[=0]$ or $8\left(x^2-7x+\frac{17}{8}\right)[=0]$		6	M1 Factorising out 8 allow one numeric or sign error. Allow $p = 8$
	$8\left(\left(x-\frac{7}{2}\right)^2-\frac{49}{4}\right)+17[=0]$ or $8\left(\left(x-\frac{7}{2}\right)^2-\frac{49}{4}+\frac{17}{8}\right)[=0]$			M1 dep Correct method for completing the square . allow a maximum of one numeric or sign error in total. Coefficient of x must be halved. Allow $p = 8$ and $q = –3.5$ oe
	$8\left(x-\frac{7}{2}\right)^2-81[=0]$			M1 dep Obtain expression in the required form, allow a maximum of one numeric or sign error in total. Allow $p = 8$, $q = –3.5$ and $r = 81$ oe **For candidates using the quadratic formula use the alternative scheme for subsequent marks.**
	$x-\frac{7}{2}=[\pm]\sqrt{\frac{81}{8}}$			M1 indep Must follow from an equation in the form $a(bx+c)^2+d=0$ for rearranging and squarerooting May be implied by a correct answer. Condone just one root given
	$x=\frac{7}{2}\pm\frac{9\sqrt{8}}{8}$			M1 dep on previous M mark. Must have 2 roots Rationalising the denominator require an expression for x in the form $a\pm b\sqrt{2}$ or $a\pm b\sqrt{8}$ where a and b are rational or $\frac{a\pm b\sqrt{2}}{c}$ or $\frac{a\pm b\sqrt{8}}{c}$ where a, b and c are integers May be implied by a correct answer.
		$x=\frac{14\pm9\sqrt{2}}{4}$		A1 oe dep on first three M marks awarded. Allow answer given as decimal if correct answer seen.

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Question	Working	Answer	Mark	Notes
25 ALT				**A candidate who attempts to complete the square should be awarded the first three marks in line with the main scheme.**
	$[x=]\dfrac{-(-56)\pm\sqrt{(-56)^2-4\times8\times17}}{2\times8}$			M1 A fully correct substitution into a fully correct quadratic equation formula. Allow if an incorrect quadratic equation is used following an attempt to complete the square as long as the expanded quadratic is clearly stated.
		$x=\dfrac{14\pm9\sqrt{2}}{4}$		A1 Correct answer only (or equivalent in the required form), must gain the previous mark to gain this. A correct solution with no working seen gains no marks. Isw if the answer is given as a decimal after correct answer seen.
				A candidate who completes the square then uses the quadratic equation formula can score a maximum of 5 marks. **A candidate who does not attempt to complete the square and who only uses the quadratic formula can score a maximum of 2 marks.**
				Total 6 marks

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Question	Working	Answer	Mark	Notes
26	$[AM =]\sqrt{\left(8\sqrt{3}\right)^2-\left(4\sqrt{3}\right)^2}\ [=12]$		7	M1 Method to find AM allow trigonometric methods eg $AM=\dfrac{4\sqrt{3}}{\tan 30}$ award this mark also if OM or OA calculated without using AM.
	$OM=\dfrac{1}{3}\times"12"[=4]$			M1 dep on previous mark. Find OM oe or OA oe Allow $OM=4\sqrt{3}\tan 30[=4]$ or $OA=\dfrac{4\sqrt{3}}{\sin 60}[=8]$
	$[\text{Area } ABC =]\dfrac{1}{2}\times 8\sqrt{3}\times"12"\left[=48\sqrt{3}\right]$ or $\left[\text{Area } ABC =\right]\dfrac{1}{2}\times 8\sqrt{3}\times 8\sqrt{3}\sin 60$			M1 Method to find area of ABC allow awrt 83.1
	$48\sqrt{3}+3\times\text{Area } BCV=150\sqrt{3}$ $\left[\text{Area } BCV=34\sqrt{3}\right]$			M1 dep on previous method mark Use of total area to find area of BCV oe allow awrt 58.9
	$VM=\dfrac{"34\sqrt{3}"}{\frac{1}{2}\times 8\sqrt{3}}[=8.5]$			M1 dep on previous mark. Use area to find VM Allow for method to find VB from area eg $\sqrt{\left(VB+4\sqrt{3}\right)\times 4\sqrt{3}\times 4\sqrt{3}\times\left(VB-4\sqrt{3}\right)}=34\sqrt{3}$ $\left[\Rightarrow VB=\sqrt{120.25}=11.0\right]$
	$OV=\sqrt{"8.5"^2-"4"^2}$			M1 dep on all previous marks $OV=\sqrt{"120.25"-"8"^2}$
		7.5		A1 cao
				Total 7 marks

Candidates may use different length or areas from those listed, any that are equivalent should gains marks as per the scheme. For reference:
Taking X as mid-point of AB and Y as the mid-point of AC
$AM = CX = BY = 12$, $AO = BO = CO = 8$, $OM = OX = OY = 4$, Area of $ABC = 48\sqrt{3} = 83.1$,

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Question	Working	Answer	Mark	Notes
Area of BCV = Area of ABV = Area of $ACV = 34\sqrt{3} = 58.9$, $VM = VX = VY = 8.5$, $VB = VA = VC = \sqrt{120.25} = 11.0$, $VO = 7.5$				

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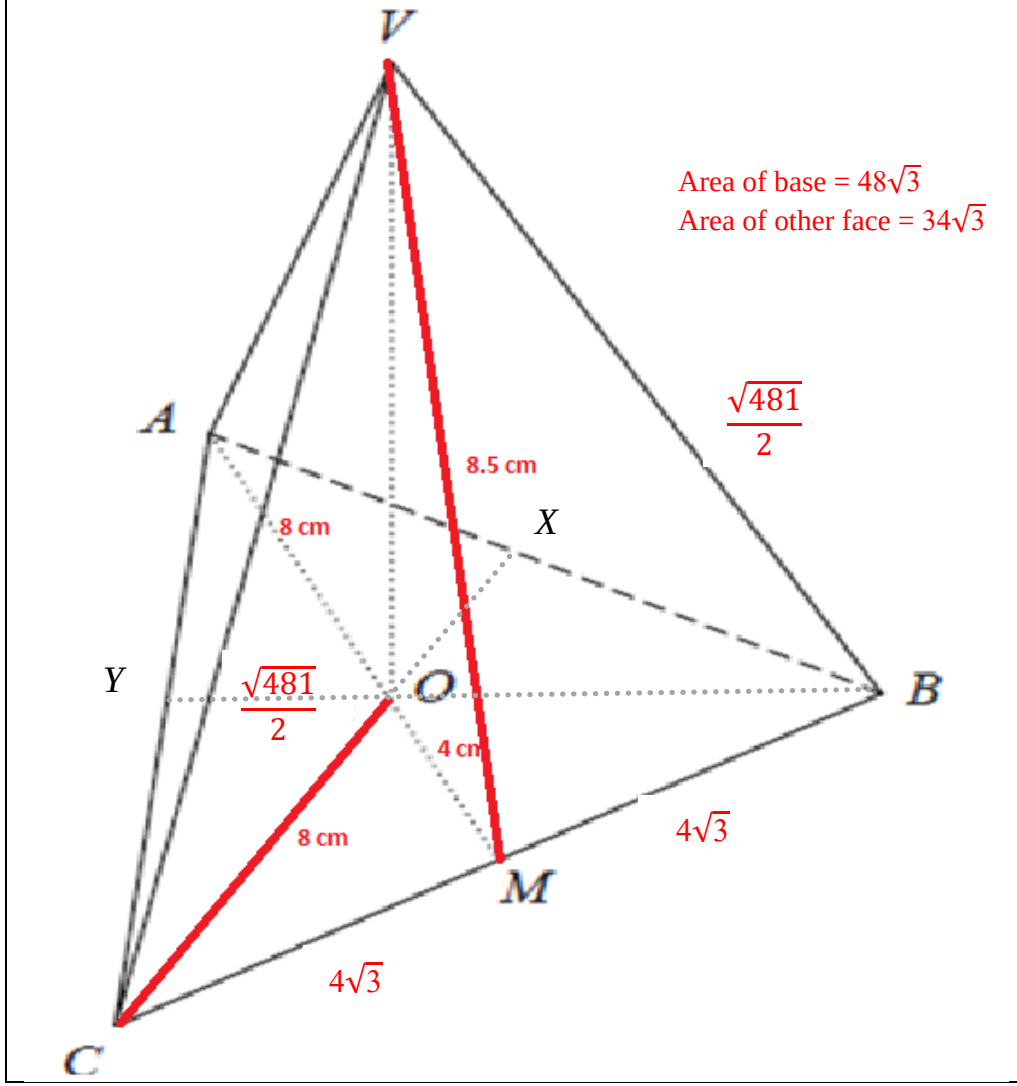
Question	Working	Answer	Mark	Notes
				$AM = CX = BY = 12$ $AO = BO = CO = 8$ $OM = OX = OY = 4$ Area of $ABC = 48\sqrt{3} = 83.1$ (3sf) Area of BCV = Area of ABV = Area of ACV $= 34\sqrt{3} = 58.9$ $VM = VX = VY = 8.5$ $VB = VA = VC = \frac{\sqrt{481}}{2} = 11.0$ (3sf) $VO = 7.5$

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Question	Working	Answer	Mark	Notes
27	$[t =]\frac{168}{x}$		7	M1 Allow $[x =]\frac{168}{t}$
	$[t =]\frac{168}{x-2}-\frac{1}{5}$ oe			M1 Allow $[x =]\frac{168}{t+0.2}+2$ do not accept $\frac{168}{x-2}-12$ or $\frac{168}{t+12}+2$ for this mark
	$\frac{168}{x-2}-\frac{1}{5}=\frac{168}{x}$ oe			Allow $\frac{168}{t+0.2}+2=\frac{168}{t}$ M1 For this mark we will accept use of 12 rather than 0.2 accept $\frac{168}{x-2}-12=\frac{168}{x}$ oe or $\frac{168}{t+12}+2=\frac{168}{t}$ oe
	$840x-x(x-2)=840(x-2)$			M1 dep on previous mark. Multiplying by a multiple of $x(x-2)$ or a multiple of $t(t+0.2)$ to form an equation with no algebraic fractions. (If previous mark awarded for $\frac{168}{t+12}+2=\frac{168}{t}$ allow for multiplying by a multiple of $t(t+12)$)
	$x^2-2x-1680=0$ oe			A1 Allow $2t^2+0.4t-33.6=0$ oe NB $12x^2-24x-336=0$ oe or $2t^2+24t-2016=0$ oe (from use of 12 rather than 0.2 do not gain this mark.)
	$(x+40)(x-42)=0$			M1 indep Correct method for solving their 3 term quadratic. For factorising 2 terms correct when multiplied out. If the formula or completing the square used, allow one sign/numerical error. Implied by answer of $x = -40$ or 42 or $t = 4$ or -4.2
		42		A1 Answer of 42 only for this mark. Do not accept –40 or 42
				Total 7 marks