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**GCSE**  
**MATHEMATICS**  
**8300/1H**

Higher Tier Paper 1 Non-Calculator

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Mark scheme

June 2025

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Version: 1.0 Final



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.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from [aqa.org.uk](http://aqa.org.uk)

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**Glossary for Mark Schemes**

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

<b>M</b>	Method marks are awarded for a correct method which could lead to a correct answer.
<b>A</b>	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
<b>B</b>	Marks awarded independent of method.
<b>ft</b>	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
<b>SC</b>	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
<b>M dep</b>	A method mark dependent on a previous method mark being awarded.
<b>B dep</b>	A mark that can only be awarded if a previous independent mark has been awarded.
<b>oe</b>	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
<b>[a, b]</b>	Accept values between a and b inclusive.
<b>[a, b)</b>	Accept values $a \leq \text{value} < b$
<b>3.14 ...</b>	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
<b>Use of brackets</b>	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles.

**Diagrams**

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

**Responses which appear to come from incorrect methods**

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

**Questions which ask students to show working**

Instructions on marking will be given but usually marks are not awarded to students who show no working.

**Questions which do not ask students to show working**

As a general principle, a correct response is awarded full marks.

**Misread or miscopy**

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

**Further work**

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

**Choice**

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

**Work not replaced**

Erased or crossed out work that is still legible should be marked.

**Work replaced**

Erased or crossed out work that has been replaced is not awarded marks.

**Premature approximation**

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

**Continental notation**

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

Q	Answer	Mark	Comments
1	Correct method to eliminate one variable	M1	eg $5y - y = 18 - 6$ or $18 - 5y = 6 - y$ or $5 \times 2x - 2x = 5 \times 6 - 18$ or $\frac{18 - 2x}{5} = 6 - 2x$
	$4y = 12$ or $-4y = -12$ or $y = 3$ or $8x = 12$ or $-8x = -12$ or $x = 1.5$	M1dep	oe equation in form $ax = b$ or $cy = d$
	$x = 1.5$ and $y = 3$	A1	oe
	<b>Additional Guidance</b>		
	Intention to subtract is sufficient for M1 eg $2x + 5y = 18$ $\underline{2x + y = 6}$ –		M1
	Correct values embedded in both equations		M2A0
	Correct values embedded in one equation		M1M0A0

Q	Answer	Mark	Comments
2	$1.07 \times 9$ or $9.6(3)$ or $1.17 \times 9$ or $10.5(3)$	M1	
	10	A1	SC1 $\frac{10}{9}$ oe
	<b>Additional Guidance</b>		
	Answer 10		M1A1
	Answer $\frac{10}{9}$ or embedded answer eg $1.07 < \frac{10}{9} < 1.17$ oe		SC1

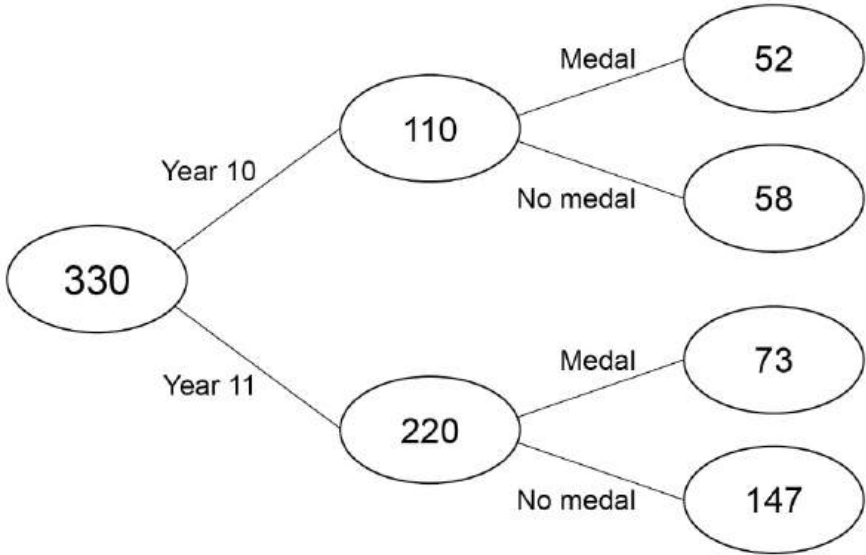
Q	Answer	Mark	Comments
3	$11 \times 8.5$	M1	oe
	93.5	A1	oe accept 93 or 94 with 93.5 seen SC1 digits 935

Q	Answer	Mark	Comments
4	10 or 26 used	M1	
	16	A1	
	<b>Additional Guidance</b>		
	10 from $12 - 2$ or $33 - 23$ does not score M1		

Q	Answer	Mark	Comments
5	True May be true True	B3	B1 for each
	<b>Additional Guidance</b>		
	Any unambiguous indication, but if a tick and a cross are used in the same row, mark the tick		
	A row with more than one tick is incorrect for that row		

Q	Answer	Mark	Comments
6(a)	$6 \times 10^{-3}$	B2	condone extra zeros which do not affect the value eg $6.0 \times 10^{-3}$ B1 correct value not in standard form (allow value written as $a \times 10^n$ ) eg 0.006 or $0.6 \times 10^{-2}$ <b>or</b> given calculation with 0.6 written as $6 \times 10^{-1}$ eg $6 \times 10^{-1} \div 100$ <b>or</b> value whose only non-zero digit is 6 correctly converted to standard form answer eg $0.0006 = 6 \times 10^{-4}$
	<b>Additional Guidance</b>		
	$6 \times 10^{-1} \div 10^2$		B1

Q	Answer	Mark	Comments
6(b)	$1.2 \times 10^8$	B2	condone extra zeros which do not affect the value eg $1.20 \times 10^8$ B1 120 000 000 or 120 million or $12 \times 10^7$ or $120 \times 10^6$ or $1.2 \times 10^a \times 10^b$ where $a + b = 8$ or value whose only non-zero digits are 12 correctly converted to standard form answer eg $12\,000\,000 = 1.2 \times 10^7$

Q	Answer	Mark	Comments	
7	330 ÷ (1 + 2) or 110 or 220	M1	oe	
	110 in Year 10 and 220 in Year 11	A1		
	52 in Year 10 Medal and 73 in Year 11 Medal	B1		
	Year 10 Medal + Year 10 No medal = Year 10 and Year 11 Medal + Year 11 No medal = Year 11	B1ft	ft their values	
	<b>Additional Guidance</b>			
	Diagram takes precedence			
	If the values are given as probabilities, with the required value as the numerator, withhold the first A mark or B mark			
			M1A1B1B1	

Q	Answer	Mark	Comments	
8	Correct method to divide by $\frac{1}{2}$	M1	implied by 0.4 or $\frac{2}{5}$ or $\frac{1}{2.5}$	
	Correct method to add two fractions with different denominators	M1	implied by $\frac{7}{15}$	
	$\frac{2}{3}$	A1	oe fraction eg $\frac{10}{15}$ SC2 $\frac{14}{15}$ oe fraction	
	<b>Additional Guidance</b>			
	SC2 is from $\left(\frac{4}{15} + \frac{1}{5}\right) \div \frac{1}{2}$			
	Ignore incorrect simplification of a correct fraction to another fraction eg $\frac{10}{15} = \frac{4}{5}$			M1M1A1
Correct answer in working but answer given as a decimal			M1M1A0	

Q	Answer	Mark	Comments
9	$\frac{2}{5}$	B1	

Q	Answer	Mark	Comments
10	$x^2 + 2x - 5x - 10$	M1	oe with brackets expanded four terms in any order with three correct from $x^2 (+)2x -5x -10$ terms may be seen in a grid implied by $x^2 - 3x + k \quad (k \neq 0)$ or $ax^2 - 3x - 10 \quad (a \neq 0)$
	$x^2 - 3x - 130 (= 0)$	M1dep	oe expression/equation with brackets expanded eg $x^2 + 2x - 5x - 10 = 120$
	For their three-term quadratic,  correctly factorises  or correctly substitutes into the quadratic formula  or correctly completes the square to the form $x = \dots$ for their quadratic or -10 and 13	M1	do not accept $x^2 - 3x - 10 (= 0)$ as their three-term quadratic  eg $(x + 10)(x - 13) (= 0)$ eg $\frac{- -3 \pm \sqrt{(-3)^2 - 4 \times 1 \times -130}}{2 \times 1}$  eg $(x =) 1.5 \pm \sqrt{\left(\frac{3}{2}\right)^2 + 130}$
	13	A1	SC1 31.5 oe
	<b>Additional Guidance</b>		
	The first and third marks may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	SC1 is for using the perimeter		
	Trial and improvement is 0, 3 (for -10 and 13) or 4 marks		

Q	Answer	Mark	Comments
11(a)	$\begin{pmatrix} 6 \\ -2 \end{pmatrix}$	B1	condone $\begin{pmatrix} +6 \\ -2 \end{pmatrix}$ or written as a fraction

Q	Answer	Mark	Comments
11(b)	<b>Alternative method 1: rotation 180°</b>		
	180° or $\frac{1}{2}$ turn <b>and</b> (0, 3)	B2	ignore clockwise or anticlockwise B1 180° or $\frac{1}{2}$ turn <b>or</b> (0, 3) with incorrect rotation
	<b>Alternative method 2: rotation 90° clockwise</b>		
	90° clockwise or 270° anticlockwise or $\frac{1}{4}$ turn clockwise or $\frac{3}{4}$ turn anticlockwise <b>and</b> (-1, 0)	B2	B1 90° clockwise or 270° anticlockwise or $\frac{1}{4}$ turn clockwise or $\frac{3}{4}$ turn anticlockwise <b>or</b> (-1, 0) with incorrect rotation
	<b>Alternative method 3: rotation 90° anticlockwise</b>		
	90° anticlockwise or 270° clockwise or $\frac{1}{4}$ turn anticlockwise or $\frac{3}{4}$ turn clockwise <b>and</b> (1, 6)	B2	B1 90° anticlockwise or 270° clockwise or $\frac{1}{4}$ turn anticlockwise or $\frac{3}{4}$ turn clockwise <b>or</b> (1, 6) with incorrect rotation
	<b>Additional Guidance</b>		
	Accept counterclockwise for anticlockwise		
	For the centre of rotation, condone missing brackets on coordinates, but not written as a vector		
	Other or compound transformation stated or implied eg 'about the line' or 'scale factor' or 'moved by $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$ '		B0

Q	Answer	Mark	Comments
12	<b>Alternative method 1: works out the value of one share</b>		
	27 ÷ (8 – 5) or 27 ÷ 3 or 9	M1	oe implied by 72 or 45 identified or used
	their 9 × 8 + their 9 × 5 or 72 + 45 <b>or</b> their 9 × (8 + 5) or their 9 × 13	M1dep	oe
	117	A1	SC1 43.81 or 43.87 or 43.88 or 43.94
	<b>Alternative method 2: sets up and solves an equation</b>		
	$\frac{8}{5} = \frac{x+27}{x}$ or $x = 45$ or $\frac{8}{5} = \frac{y}{y-27}$ or $y = 72$ or $\frac{(8-5)w}{8+5} = 27$	M1	oe equation any letter
	their 45 + their 45 + 27 or their 72 + their 72 – 27 or 27 × (8 + 5) ÷ (8 – 5)	M1dep	oe
	117	A1	SC1 43.81 or 43.87 or 43.88 or 43.94

The mark scheme for question 12 continues on the next page

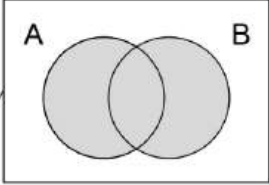
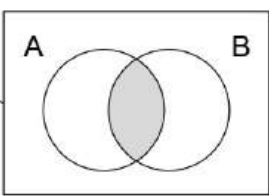
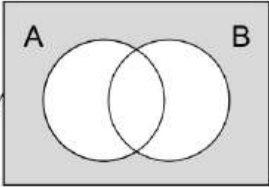
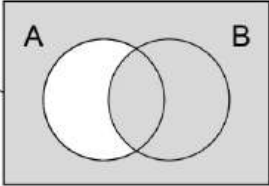
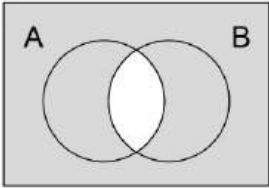
<b>12 cont</b>	<b>Alternative method 3: trial and improvement with values in the correct ratio</b>		
	8, 16, 24, 32, 40, 48, 56, 64, 72... and 5, 10, 15, 20, 25, 30, 35, 40, 45...	M1	repeated multiples of 8 and 5 until the difference is 27  if the lists continue, 72 or 45 must be identified or used
	72 + 45	M1dep	oe
	117	A1	SC1 43.81 or 43.87 or 43.88 or 43.94
	<b>Additional Guidance</b>		
	SC1 is for thinking Oscar has £27, with rounding at different stages		

Q	Answer	Mark	Comments
<b>13</b>	61	B2	B1 ( $c =$ ) $4^3$ oe or ( $c =$ ) 64 and ( $d =$ ) $5^3$ oe or ( $d =$ ) 125 <b>or</b> their answer comes from $x^3 - (x - 1)^3$ correctly calculated, where $x$ is an integer $\neq 5$ eg answer 91 from $216 - 125$ SC1 –61
	<b>Additional Guidance</b>		
	SC1 is for $c - d$		
	Do not allow 64 or 125 seen in a list if not identified or used		

Q	Answer	Mark	Comments												
14(a)	<table border="1"> <tr> <td><math>x</math></td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td><math>y</math></td> <td>0.5</td> <td>1</td> <td>2</td> <td>4</td> <td>8</td> </tr> </table>	$x$	-1	0	1	2	3	$y$	0.5	1	2	4	8	B2	oe B1 2 correct values
	$x$	-1	0	1	2	3									
	$y$	0.5	1	2	4	8									
<b>Additional Guidance</b>															
Mark the table only															

Q	Answer	Mark	Comments
14(b)	4 or 5 points plotted correctly	M1	correct or ft their table in (a) $\pm \frac{1}{2}$ square points may be implied by graph passing through them
	Correct smooth curve		A1 $\pm \frac{1}{2}$ square for the five correct points
	<b>Additional Guidance</b>		
	Ignore extra points plotted with different $x$ -coordinates		
	Two points with the same integer $x$ -coordinate, with the curve going through neither, is choice for plotting of that point and therefore incorrect		
	Ignore the curve drawn outside $(-1, 0.5)$ and $(3, 8)$		
	For tolerance, $\pm \frac{1}{2}$ square can be vertically or horizontally		
	Ruled straight lines		A0

Q	Answer	Mark	Comments
15	<b>Alternative method 1: from triangle ADC</b>		
	$CAB = 20$	M1	
	$ACB = 180 - 20 - 20$ or $ACB = 140$ or $ACD = 40$	M1dep	oe
	$ADC = 90$ or $ADB = 90$	M1	
	50	A1	
	<b>Alternative method 2: from triangle ADB</b>		
	$ADC = 90$ or $ADB = 90$	M1	
	$DAB = 180 - 90 - 20$ or $DAB = 70$	M1dep	oe
	$CAB = 20$	M1	
	50	A1	
	<b>Additional Guidance</b>		
	Angles may be seen on the diagram throughout		
	For an incomplete method, for angles not marked in the correct position on the diagram the correct 3-letter codes must be given, but condone <i>D</i> for <i>ADC</i> or <i>ADB</i>		
	$ADC = 90$ or $ADB = 90$ may be designated by a square at the angle		

Q	Answer	Mark	Comments
16	All three correct	B3	B2 two correct B1 one correct
	<b>Additional Guidance</b>		
	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; align-items: center; margin-bottom: 20px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 20px;"><math>A \cap B</math></div> <div style="text-align: center;"> <math>\xi</math>   </div> </div> <div style="display: flex; align-items: center; margin-bottom: 20px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 20px;"><math>A \cup B</math></div> <div style="text-align: center;"> <math>\xi</math>   </div> </div> <div style="display: flex; align-items: center; margin-bottom: 20px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 20px;"><math>A' \cup B</math></div> <div style="text-align: center;"> <math>\xi</math>   </div> </div> <div style="display: flex; align-items: center; margin-bottom: 20px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 20px;"><math>A' \cap B'</math></div> <div style="text-align: center;"> <math>\xi</math>   </div> </div> <div style="text-align: center;"> <math>\xi</math>   </div> </div>	B3	
Two lines from a left-hand box is choice			

Q	Answer	Mark	Comments
17(a)	$\frac{5}{6}$ Raining No and $\frac{4}{13}$ Raining Yes, Bus on time Yes	B1	
	$\frac{8}{13}$ Raining No, Bus on time Yes and $\frac{5}{13}$ Raining No, Bus on time No	B1ft	both correct <b>or</b> ft $2 \times$ their $\frac{4}{13}$ and $1 - (2 \times \text{their } \frac{4}{13})$ where their $\frac{4}{13} < \frac{1}{2}$
	<b>Additional Guidance</b>		
	oe fractions, decimals or percentages throughout		

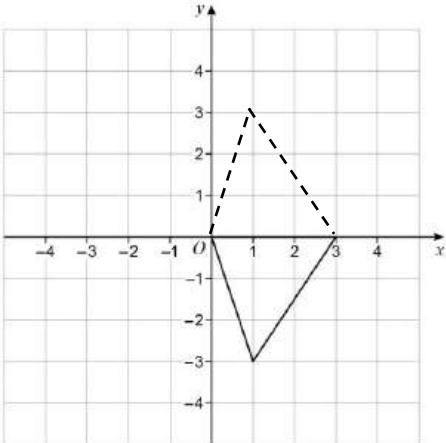
Q	Answer	Mark	Comments
17(b)	$\frac{1}{6} \times \frac{9}{13}$	M1	oe may be seen on tree diagram
	$\frac{9}{78}$ or $\frac{3}{26}$	A1	oe fraction, decimal or percentage
	<b>Additional Guidance</b>		
	Ignore any attempt to simplify or convert after correct answer seen		
	There is no follow through for incorrect values		

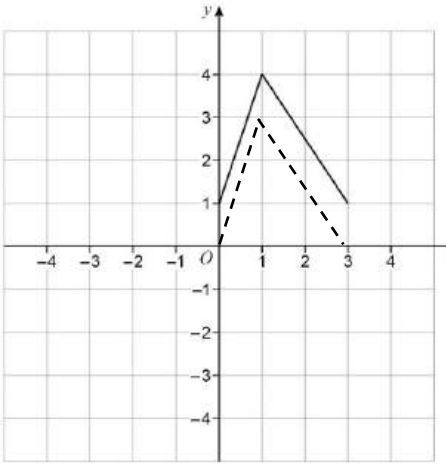
Q	Answer	Mark	Comments
<b>18</b>	$\sin 30 = \frac{1}{2}$ and $\cos 45 = \frac{1}{\sqrt{2}}$ or $\frac{\sqrt{2}}{2}$ and $\tan 60 = \sqrt{3}$	M2	oe eg $\frac{1}{2} \times \frac{1}{\sqrt{2}}$ or $\frac{1}{2} \times \frac{\sqrt{2}}{2}$ or $\frac{1}{2\sqrt{6}}$ may be seen in a table implied by position in a calculation eg $\frac{1}{2} \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{3}}$ is correct for M2 M1 1 or 2 correct values
	$\frac{\sqrt{6}}{12}$ with all three correct values seen	A1	oe in the form $\frac{\sqrt{a}}{b}$ eg $\frac{\sqrt{24}}{24}$ condone $a = 6$ and $b = 12$ with all three correct values seen
	<b>Additional Guidance</b>		
	Allow $\sqrt{1}$ for 1 throughout		
	Allow, eg $\frac{\sqrt{3}/2}{1/2}$ for tan 60		
	Correct answer from $\frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{3}}$ scores only M1 for tan 60 unless the correct values are attributed to sin 30 and cos 45 elsewhere in the working		
Do not allow further work eg $\frac{\sqrt{6}}{12} = \frac{\sqrt{1}}{2}$ (with all three correct values seen)			M2A0

Q	Answer	Mark	Comments	
19(a)	$\frac{64}{27}$ or $2\frac{10}{27}$	B3	B2 shows understanding of at least two of <ul style="list-style-type: none"> <li>• a negative index means reciprocal</li> <li>• an index of <math>\frac{1}{2}</math> means square root</li> <li>• an index of 3 means cube</li> </ul> B1 shows understanding of one of the above	
	<b>Additional Guidance</b>			
	Condone missing brackets			
	Allow equivalent decimals, fractions or mixed numbers throughout			
	Ignore any attempt to simplify, change to a mixed number or convert to a decimal after a correct answer is seen  eg $\frac{64}{27} = 2\frac{20}{27}$			B3
	Understanding can be shown in expressions which are not equivalent to the original  eg $\frac{27}{64}$ implies understanding of square root and cubing, but not reciprocal			B2
	Example B2 expressions: $\left(\frac{1/\sqrt{9}}{1/\sqrt{16}}\right)^3$ or $\left(\frac{4096}{729}\right)^{\frac{1}{2}}$ or $\left(\frac{27}{64}\right)^{-1}$			B2
	Example B1 expressions: $\left(\frac{16}{9}\right)$ or $\left(\frac{3}{4}\right)^{-3}$ or $\left(\frac{729}{4096}\right)^{-\frac{1}{2}}$			B1
	To show understanding, correct method or value for calculation of a cube is required, but calculation of a square root is not required  eg1 $\left(\frac{\sqrt{9}}{\sqrt{16}}\right)^3$ only shows understanding of the square root  eg2 $\left(\frac{\sqrt{9}}{\sqrt{16}}\right) \times \left(\frac{\sqrt{9}}{\sqrt{16}}\right) \times \left(\frac{\sqrt{9}}{\sqrt{16}}\right)$ shows understanding of the square root and cubing			B1  B2

Q	Answer	Mark	Comments
19(b)	1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$	B2	B1 $125^{\frac{1}{2}}$ or $(5^3)^{\frac{1}{2}}$ or $(5^{\frac{1}{2}})^3$ or $5^{\frac{3}{2}}$ or $125 = 5^{2n}$ or $5^3 = 5^{2n}$ or $2n = 3$

Q	Answer	Mark	Comments
20	$2\sqrt{11}$ and $3\sqrt{11}$ and $5\sqrt{11}$	M2	M1 any one or two correct values
	$10\sqrt{11}$	A1	condone $a = 10$ and $n = 11$

Q	Answer	Mark	Comments
21(a)	<p>Fully correct graph</p> 	B1	<p>mark intention                      accept horizontal line drawn joining the two lines                      condone dashed lines                      ignore shading</p>

Q	Answer	Mark	Comments
21(b)	<p>Fully correct graph</p> 	B1	<p>mark intention                      accept horizontal line drawn joining the two lines                      condone dashed lines                      ignore shading</p>

Q	Answer	Mark	Comments
22	Correct method for finding the difference between the $x$ or $y$ coordinates for the points $E$ and $G$ (positive or negative differences)	M1	eg $6 - (-18)$ or $24$ or $3 - 9$ or $-6$ implied by gradient = $-\frac{1}{4}$
	Correct method for finding the difference between the $x$ or $y$ coordinates for the points $E$ and $F$ or the points $F$ and $G$ (positive or negative differences)	M1dep	eg $\frac{-18-6}{3}$ or $-8$ or $-16$ or $\frac{9-3}{3}$ or $2$ or $4$
	$(-10, 7)$	A1	SC1 $(-2, 5)$ or $(-12, 7.5)$ oe
	<b>Additional Guidance</b>		
	SC1 $(-2, 5)$ is for $EF = \frac{2}{3}EG$		
	SC1 $(-12, 7.5)$ is for $EF = \frac{1}{3}FG$		
	Working may be seen on the diagram		
	$(-10, \dots)$ or $(\dots, 7)$		M1M1

Q	Answer	Mark	Comments
23(a)	$(x + 6)^2 \dots$ or $(x + 6)(x + 6) \dots$	M1	accept $\left(x + \frac{12}{2}\right)^2$ implied by grid for $(x + 6)(x + 6)$
	$(x + 6)^2 + 14$	A1	condone $a = 6$ and $b = 14$
	<b>Additional Guidance</b>		
	$(x + 6)^2$ may be $(x + 6)(x + 6)$ or $(6 + x)^2$ or $(x + 6)(6 + x)$ throughout		

Q	Answer	Mark	Comments
23(b)	$(+3, -8)$	B2	B1 for each coordinate

Q	Answer	Mark	Comments
24	Partially or fully factorises numerator	M1	eg $15x(4x^3 - x)$ or $x^2(60x^2 - 15)$ or $15x^2(2x - 1)(2x + 1)$
	Factorises at least one denominator or correct multiplication of the denominators	M1	eg $-(2x + 1)$ and/or $3(2x - 1)$  eg $-12x^2 + (6x - 6x +) 3$ may be in a grid
	Converts numerators and denominators into terms which can be fully cancelled	M1dep	dep on M1M1 eg $\frac{15x^2(2x-1)(2x+1)}{-(2x+1)3(2x-1)}$ or $\frac{15x^2(2x-1)(2x+1)}{-(2x+1)} \times \frac{1}{3(2x-1)}$ or $\frac{5x^2(12x^2-3)}{-(12x^2-3)}$  factorisation and cancelling may be done in stages
	$\frac{15x^2}{-3}$ or $-5x^2$ with M3 awarded and explanation that $x^2$ cannot be negative	A1	oe with full cancelling of algebraic terms  condone explanation that $x^2$ must be positive
	<b>Additional Guidance</b>		
	$\frac{20x^4 - 5x^2}{(-2x-1)(2x-1)}$ or $\frac{20x^4 - 5x^2}{-4x^2 + 1}$ implies M1M1 as 3 has been cancelled from both		M1M1
	$\frac{5x^2(2x+1)}{-(2x+1)}$ implies complete factorisation of numerator and denominator as 3 and $(2x - 1)$ have been cancelled from both		M1M1M1

Q	Answer	Mark	Comments
<b>25</b>	$\frac{6}{n}$ or $\frac{5}{n-1}$	M1	may be seen on a tree diagram
	$\frac{6}{n} \times \frac{5}{n-1} = \frac{1}{8}$	M1dep	oe eg $n(n-1) = 240$
	Correctly rearranges their equation, which must be correct or of the form $\frac{6}{n} \times \frac{a}{n+b} = \frac{1}{8}$ , where $a$ and $b$ are integers, into a quadratic equation with brackets expanded and no unknowns in denominators	M1dep	dep on 1st M1 $n^2 - n = 240$ or $n^2 - n - 240 = 0$ implies M1M1M1
	For their three-term quadratic, correctly factorises  or correctly substitutes into the quadratic formula  or correctly completes the square to the form $n = \dots$ for their quadratic  or -15 and 16	M1	eg $(n+15)(n-16) (=0)$  eg $\frac{-1 \pm \sqrt{(-1)^2 - 4 \times 1 \times -240}}{2 \times 1}$  eg $\frac{1}{2} \pm \sqrt{240.25}$
	16 with at least the first two marks awarded	A1	SC1 16 with no other marks awarded and not from incorrect working
	<b>Additional Guidance</b>		
	Accept the use of any letter throughout		
	16 from trial and improvement, or without working		SC1
	$\frac{6}{n} \times \frac{5}{n} = \frac{1}{8}$ , $n^2 = 240$ , $n = 4\sqrt{15}$		M1M0M1 M0A0
	The second mark may be awarded for work done in stages eg $\frac{6}{n} \times \frac{5}{n-1} = \frac{36}{n(n-1)}$ then $\frac{36}{n(n-1)} = \frac{1}{8}$ implies $\frac{6}{n} \times \frac{5}{n-1} = \frac{1}{8}$  (36 should be 30, which does not affect these marks but means they cannot get the third mark)		M1M1