

INTERNATIONAL GCSE MATHEMATICS

9260/1E

Extension Tier Paper 1E

Mark scheme

June 2025

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2 5 6 Y 9 2 6 0 / 1 E / M S

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Key to mark types and abbreviations

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

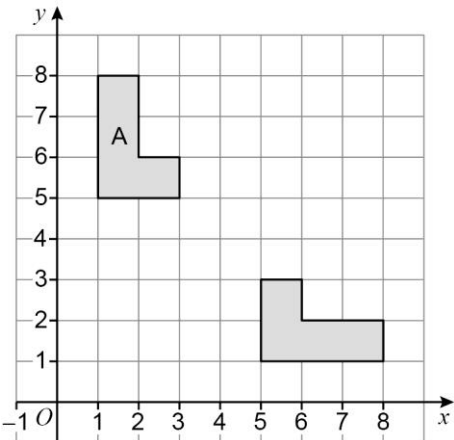
Q	Answer	Mark	Comments
1	<p>All 3 correct</p> <p>Increases 500 by 7</p> <p>Increases 500 by 7%</p> <p>Works out 7% of 500</p> <p>Decreases 500 by 7%</p> <p>500×1.07</p> <p>$500 + 7$</p> <p>500×0.93</p> <p>500×1.93</p> <p>500×0.07</p>	B3	<p>B2 2 correct</p> <p>B1 1 correct</p>
	Additional Guidance		
	2 lines from a left-hand box is choice		

Q	Answer	Mark	Comments
2	24.5	B1	oe

Q	Answer	Mark	Comments
3	1.0484×10^7	B2	<p>condone extra zeros which do not affect the value eg 1.0484000×10^7 B1 correct value not in standard form eg 10484000 or 10.484×10^6 or 8.64×10^5 or value not in standard form correctly converted to standard form</p>

Q	Answer	Mark	Comments
4	Alternative method 1: works out the number for each and subtracts		
	0.35×200 or 70 or $(1 - 0.35) \times 200$ or 0.65×200 or 130	M1	oe
	$(1 - 0.35) \times 200 - 0.35 \times 200$ or $130 - 70$	M1dep	oe
	60	A1	
	Alternative method 2: uses the difference in probabilities		
	$(1 - 0.35) - 0.35$ or 0.3	M1	oe
	their 0.3×200	M1dep	oe
	60	A1	

Q	Answer	Mark	Comments
5	$6y + 8y - 4 = 31$ or $14y - 4 = 31$	M1	oe
	$14y = 31 + 4$ or $14y = 35$ or $(y =) 2.5$ or $(31 + 4) \div 14$ or 2.5	M1dep	oe
	$6 \times \text{their } 2.5$ or 15 or $8 \times \text{their } 2.5 - 4$ or 16 or $2 \times \text{their } 2.5 - 4$ or 1	M1dep	oe
	15 and 16 and No or 15 and twice 15 is 30 and No or 16 and twice 16 is 32 and No or White is 1 more and No	A1	oe eg 15 and half of 31 is 15.5 and No
	Additional Guidance		
	Trial and improvement needs to get to 2.5 to score the first two marks		
	15 < 16 without a correct decision		M3A0
	Answer $6y < 8y - 4$ with 15 and 16 seen		M3A1

Q	Answer	Mark	Comments	
6(a)		B2	allow unruled edges if intention is clear B1 vertices correct without shape drawn or line $y = x$ drawn or shape with correct size and orientation but incorrect position	
	Additional Guidance			
	Ignore shading			

Q	Answer	Mark	Comments	
6(b)	Rotation, 90° anticlockwise, (0, 0) or rotation, 270° clockwise, (0, 0)	B3	B2 rotation, 90° anticlockwise or rotation, (0, 0) or rotation, 270° clockwise or 90° anticlockwise, (0, 0) or 270° clockwise, (0, 0)	
			B1 rotation or 90° anticlockwise or 270° clockwise or (0, 0)	
			Additional Guidance	
			Accept rotate or rotating for rotation	
			Accept counter-clockwise for anti-clockwise	
			Accept the origin or O for (0, 0)	
			Condone quarter turn for 90° and three-quarter turn for 270°	
			Condone missing degrees symbol and/or missing coordinate brackets, but do not accept coordinates in vector form	
			Other or combined transformation eg1 rotate 90 anticlockwise and move 4 down and 6 left eg2 reflection, (0, 0)	B0 B0

Q	Answer	Mark	Comments
7	At least two terms correct from $10x + 30 - 6 + 2x$	M1	implied by $12x$ or $(+) 24$
	$12x + 24$	A1	oe
	$12(x + 2)$ or $a = 12$ and $b = 2$	B1ft	ft their $12x + 24$ in the form $a(x + b)$ with M1 scored
	Additional Guidance		
	$10x + 30 - 6 - 2x = 8x + 24 = 8(x + 3)$		M1A0B1ft
	Ignore any attempt to 'solve' an equation		

Q	Answer	Mark	Comments
8(a)	Shaded circle at -1 with an arrow to the right	B1	mark intention circle and arrow can be above, on or below the line

Q	Answer	Mark	Comments
8(b)	$6x < 15 + 9$ or $6x < 24$ or $24 \div 6$ or 4	M1	oe eg $2x < 5 + 3$ or $x - 1.5 < 2.5$
	$x < 4$ or $4 > x$	A1	
	Additional Guidance		
	$x \geq 4$ or $x > 4$ or $x \leq 4$ or $x = 4$		M1A0
	$x < 4$ in working and 4 on answer line		M1A0

Q	Answer	Mark	Comments
9(a)	280 split into factors where at least one factor is prime	M1	eg 2 and 140 or $14 \times 5 \times 4$ or $280 \div 40 = 7$ may be seen on a factor tree or in repeated division
	$2^3 \times 5 \times 7$	A1	any order
	Additional Guidance		
	M1 may be awarded for correct work with no or incorrect answer, even if this is seen among multiple attempts		
	Allow any number of 1s for M1		
	Condone full stops as multiplication signs for M1A1		
	Condone + instead of $\times$ for M1		
	For M1, allow one strand to be incorrect if a previous value completes the product eg 28×10 followed by $3 \times 7 \times 2 \times 5$ scores M1 for implied $28 \times 2 \times 5$		M1A0
	$2^3 \times 5 \times 7$, but answer given not in index form		M1A0

Q	Answer	Mark	Comments
9(b)	2520	B2ft	<p>B1</p> <p>at least two multiples of 90 > 90 and at least two multiples of 280 > 280</p> <p>or</p> <p>(90 =) $2 \times 3^2 \times 5$ or 2 and 3 and 3 and 5</p> <p>or</p> <p>(answer =) $2^3 \times 3^2 \times 5 \times 7$ oe ft their part (a)</p> <p>or</p> <p>(answer =) any multiple of 2520 > 2520 (may be given as a product of prime factors)</p>
			Additional Guidance
			For products of prime factors, ignore 1s
			For products of prime factors, allow in Venn diagrams or factor trees or repeated division
			Multiples of 2520 are 5040, 7560, 10 080, 12 600 ...

Q	Answer	Mark	Comments
10	$360 \div (7 + 5 + 3)$ or 24 or $\frac{7-3}{7+5+3}$ or $\frac{4}{15}$	M1	oe implied by 168 or 120 or 72 may be implied
	$7 \times \text{their } 24$ and $3 \times \text{their } 24$ or 168 and 72 or $(7 - 3) \times \text{their } 24$ or their $\frac{4}{15} \times 360$	M1dep	oe
	96	A1	SC1 48
	Additional Guidance		
	SC1 is for using 180 instead of 360		

Q	Answer	Mark	Comments
11	Alternative method 1: changes to improper fractions		
	$(4\frac{1}{8} =) \frac{33}{8}$ and $(2\frac{5}{24} =) \frac{53}{24}$	M1	
	$\frac{33}{8} = \frac{99}{24}$ and $\frac{53}{24}$ or $\frac{33}{8} = \frac{198}{48}$ and $\frac{53}{24} = \frac{106}{48}$	M1dep	oe with a common denominator
	$\frac{99}{24} - \frac{53}{24} = \frac{46}{24}$ and $\frac{46}{24} = \frac{23}{12} = 1\frac{11}{12}$ with M1M1 awarded	A1	oe demonstration that both sides of the equation are equal eg $\frac{198}{48} - \frac{106}{48} = \frac{92}{48}$ and $\frac{92}{48} = \frac{23}{12} = 1\frac{11}{12}$

Question 11 continues on next page

Q	Answer	Mark	Comments
11 cont	Alternative method 2: deals with fraction parts and then includes the integers		
	$(4)\frac{3}{24}$ or $(4)\frac{6}{48}$ and $(2)\frac{10}{48}$	M1	oe with a common denominator
	$4\frac{3}{24} - 2\frac{5}{24} = 1\frac{22}{24}$	M1dep	oe with a common denominator eg $(4)\frac{3}{24} - (2)\frac{5}{24} = (2) - \frac{2}{24}$ or $4\frac{6}{48} - 2\frac{10}{48} = 1\frac{44}{48}$
	$4\frac{3}{24} - 2\frac{5}{24} = 1\frac{22}{24}$ and $1\frac{22}{24} = 1\frac{11}{12}$ with M1M1 awarded	A1	oe demonstration that both sides of the equation are equal
	Additional Guidance		
	Accept working with both sides to show they come to a common value eg right side changed to $\frac{23}{12}$ and left side worked out to be $\frac{23}{12}$	M1M1A1	
	Accept eg $\frac{33 \times 3}{24}$ for $\frac{99}{24}$ unless contradicted		

Q	Answer	Mark	Comments
12	Alternative method 1: setting up gradient equation		
	$\frac{13 - -2}{4 - a} = 6$ or $15 = 6(4 - a)$	M1	oe eg $\frac{-2 - 13}{a - 4} = 6$
	1.5	A1	oe
	Alternative method 2: using given gradient to work out difference in x first		
	$(13 - -2) \div 6$ or 2.5	M1	oe
	1.5	A1	oe
	Alternative method 3: using $y = mx + c$		
	$13 - 6 \times 4$ or -11	M1	oe may be seen in an equation eg $13 = 6 \times 4 + c$ or $-2 = 6a - 11$
	1.5	A1	oe

Q	Answer	Mark	Comments
13	$\begin{pmatrix} 20 & 19 \\ 16 & -12 \end{pmatrix}$	B2	B1 one, two or three terms correct or $\begin{pmatrix} 3 \times 4 + 2 \times 4 & 3 \times 7 - 2 \times 1 \\ -1 \times 4 + 5 \times 4 & 7 \times -1 - 1 \times 5 \end{pmatrix}$ oe must be a 2×2 matrix

Q	Answer	Mark	Comments
14	Intersecting arcs, equal radii $>$ half AB , either side of AB	M1	± 2 mm
	Perpendicular bisector of AB drawn with correct construction	A1	± 2 mm arcs required may be dashed or dotted must reach from one shore to the other
	Correct region shown with perpendicular bisector in tolerance	B1	no construction arcs for bisector required region must be on the island only
	Additional Guidance		
	Allow any unambiguous identification of region eg labelled R or shaded in or shaded out		
	No arcs		B1 max

Q	Answer	Mark	Comments
15(a)	$\frac{9}{25}a^2b^8$ or $\frac{9a^2b^8}{25}$	B2	B1 2 of $\frac{9}{25}$, a^2 , b^8 in a multiplication string
	Additional Guidance		
	Allow 0.36 for $\frac{9}{25}$		
	Allow multiplication signs or multiplication dots for B2 and B1		
	B2 answer followed by incorrect further working scores B1 eg $\frac{9}{25}a^2b^8 = 225a^2b^8$		B1
	B1 answer followed by incorrect working scores B1 eg $\frac{9}{25}a^2b^4 = 225a^2b^4$		B1
	$\frac{9}{25}a^2$		B1

Q	Answer	Mark	Comments
15(b)	Partially or fully factorises numerator or $5(x + 2)$	M1	eg $6(x - 2)(x + 2)$ or $-6(4 - x^2)$ or $2(3x^2 - 12)$ or $2(3x - 6)(x + 2)$
	Converts numerator and denominator into terms that can be fully cancelled	M1dep	eg $\frac{6(x - 2)(x + 2)}{5(x + 2)}$
	$\frac{6(x - 2)}{5}$ or $\frac{6x - 12}{5}$ or $\frac{6}{5}x - \frac{12}{5}$ or $1.2x - 2.4$ with M1M1 awarded	A1	
	Additional Guidance		
	Ignore attempts to solve an equation eg $\frac{6x - 12}{5}$ with M1M1 seen followed by eg $6x - 12 = 0$ ($x =$) 2		M1M1A1
	x^2 cancelled with x and $(-)$ 24 cancelled with 10 eg $\frac{6x^2}{5x} - \frac{24}{10} = \frac{6}{5}x - \frac{12}{5}$		M0

Q	Answer	Mark	Comments
16	<p>Fully correct method to work out CD</p> <p>eg</p> $\sqrt{6.5^2 - 2.5^2}$ <p>or</p> $6.5 \times \cos \left(\sin^{-1} \frac{2.5}{6.5} \right)$ <p>or</p> $6.5 \times \sin \left(\cos^{-1} \frac{2.5}{6.5} \right)$ <p>or</p> <p>6</p>	M2	<p>implied by $AC = 20$</p> <p>M1</p> <p>2.5^2 and 6.5^2</p> <p>or 6.25 and 42.25</p> <p>or 36</p> <p>or</p> <p>$(CDE \Rightarrow) \sin^{-1} \frac{2.5}{6.5}$ or $\sin^{-1} \left(\frac{2.5 \sin 90}{6.5} \right)$</p> <p>or [22.6, 22.62]</p> <p>or</p> <p>$(CED \Rightarrow) \cos^{-1} \frac{2.5}{6.5}$ or [67.38, 67.4]</p>
	<p>$\cos 17 = \frac{26 - \text{their } 6}{AB}$</p> <p>or</p> $\frac{AB}{\sin 90} = \frac{26 - \text{their } 6}{\sin(90 - 17)}$ <p>or</p> <p>$(AC \Rightarrow) (26 - \text{their } 6) \times \tan 17$</p> <p>or 6.1(1...)</p>	M1	<p>oe</p> <p>allow any variable for AB</p> <p>$0 < \text{their } 6 < 26$ which is their CD</p>

Question 16 continues on next page

16 cont	$\frac{26 - \text{their } 6}{\cos 17}$ <p>or</p> $\frac{(26 - \text{their } 6) \sin 90}{\sin 73}$ <p>or</p> $\sqrt{(26 - \text{their } 6)^2 + \text{their } 6.1(1\dots)^2} \quad \text{or}$ $\sqrt{437(\dots)}$ <p>or</p> $\frac{\text{their } 6.1(1\dots) \sin 90}{\sin 17}$	M1dep	dep on 3rd M1 oe
	<p>20.9(1...)</p> <p>or</p> <p>21 with at least M3 scored</p>	A1	
	Additional Guidance		
	sin 90 can be seen as 1 or omitted		
	$\frac{\text{their } 6.1(1\dots)}{\sin 17} = \frac{AB}{\sin 90}$ <p>with no further correct working</p>		M2M1M0A0

Q	Answer	Mark	Comments
17	Alternative method 1: using $n + 1$		
	$6(n + 1) + 15$ or $6n + 6 + 15$ or $6n + 21$	M1	
	$6n + 15 + 6(n + 1) + 15$ or $12n + 36$	M1dep	oe $2(6n + 15) + 6$ is M2
	$12n + 36$ and $12(n + 3)$	A1	oe eg $12n + 36$ and states that $12(n)$ and 36 are both multiples of 12
	Alternative method 2: using $n - 1$		
	$6(n - 1) + 15$ or $6n + 15 - 6$ or $6n + 9$	M1	
	$6n + 15 + 6(n - 1) + 15$ or $12n + 24$	M1dep	oe $2(6n + 15) - 6$ is M2
	$12n + 24$ and $12(n + 2)$	A1	oe eg $12n + 24$ and states that $12(n)$ and 24 are both multiples of 12

Q	Answer	Mark	Comments
18	Alternative method 1: compares percentage increases in rates of pay		
	$100 \div (100 - 8)$ or $108.6(9...)(\%)$ or $108.7(\%)$	M1	oe decimal or fraction eg $\frac{25}{23}$
	or their $108.6(9...) - 100$ or $8.6(9...)(\%)$ or $8.7(\%)$	M1dep	oe decimal or fraction eg $\frac{2}{23}$
	Offer 2 and $8.6(9...)(\%)$ or $8.7(\%)$	A1	oe decimals or fractions in comparable form
	Alternative method 2: compares new rates of pay as a percentage of the old		
	$100 \div (100 - 8)$ or $108.6(9...)(\%)$ or $108.7(\%)$	M1	oe decimal or fraction eg $\frac{25}{23}$
	$100(\%) + 8(\%)$ or $108(\%)$	M1dep	oe decimal or fraction
	Offer 2 and $108(\%)$ and $108.6(9...)(\%)$ or $108.7(\%)$	A1	oe decimals or fractions in comparable form
	Alternative method 3: compares rates of pay for chosen values of pay and hours		
	Correct method for calculating new rate of pay with Offer 1	M1	eg (pay \$500 and hours 40) $500 \times 1.08 \div 40$ or $13.5(0)$
	Correct method for calculating new rate of pay with Offer 2	M1	eg $500 \div (40 \times 0.92)$ or $13.58...$ or 13.59
	Offer 2 and correct rate of pay for Offer 1 and correct rate of pay for Offer 2	A1	eg 13.5 and 13.58 and Offer 2 accept fractions in comparable form
	Alternative method 4: percentage of hours would have to work to get the same pay		
	$100 \div (100 + 8)$ or $92.5...(\%)$ or $92.6(\%)$ or $93(\%)$	M1	oe decimal or fraction eg $\frac{25}{27}$
	$100(\%) - 8(\%)$ or $92(\%)$	M1dep	oe decimal or fraction eg $\frac{23}{25}$
	Offer 2 and $92.5...(\%)$ or $92.6(\%)$ or $93(\%)$ and $92(\%)$	A1	oe decimals or fractions in comparable form

Question 18 continues on the next page

18 cont	Additional Guidance	
	Allow 109(%) for 108.6(9...)(%) with method seen	
	Comparison for A mark could be seen as a difference of their two values, evaluated correctly with correct conclusion	
	Ignore any units given	
	In alts 1 and 2, for the A mark fractional values must be in a comparable form eg1 (alt1) $\frac{2}{23}$ and Offer 2	M1M1A0
	eg2 (alt1) $\frac{2}{23}$ and $\frac{2}{25}$ and Offer 2 eg3 (alt2) $\frac{27}{25}$ and $\frac{25}{23}$ and Offer 2	M1M1A1 M1M1A0
	Alt 2, values may be seen in an equation or expression eg1 $(r =) \frac{p}{0.92h}$ eg2 $(r =) \frac{1.08p}{h}$ eg3 Offer 2 and $(r_1 =) 1.08 \frac{p}{h}$ and $(r_2 =) 1.086 \frac{p}{h}$	1st M1 2nd M1 M1M1A1

Q	Answer	Mark	Comments
19	Alternative method 1: uses formula		
	20^3 or $20 \times 20 \times 20$ or 8000	M1	oe
	$5200 \div \text{their } 8000$ or 0.65	M1dep	oe implied by 1.3
	$(x^3 =) 4900 \div (\text{their } 0.65 \times 2)$ or $3769(.2\dots)$	M1dep	oe eg $3769\frac{3}{13}$ $\frac{49}{104} \times 20^3$ is M3
	15.5(6...) or 15.6	A1	accept 16 with no incorrect working
	Alternative method 2: sets up equation		
	20^3 or $20 \times 20 \times 20$ or 8000	M1	oe
	$2 \times \frac{5200}{\text{their } 8000} = \frac{4900}{x^3}$	M1dep	oe equation
	$(x^3 =) \frac{4900 \times 20^3}{2 \times 5200}$	M1dep	oe
	15.5(6...) or 15.6	A1	accept 16 with no incorrect working
	Additional Guidance		
	Accept use of different units in working if consistent		

Q	Answer	Mark	Comments
20(a)	[18, 19]	B1	

Q	Answer	Mark	Comments
20(b)	[87, 93]	B2	B1 [147, 153] or 60
	Additional Guidance		
	Check graph		

Q	Answer	Mark	Comments
21	$6 \times 4 \div 2$ or 12	M1	oe eg 3×4
	$84 \div$ their 12 or 7	M1dep	oe implied by 35 or 42
	$5 \times$ their 7 + $5 \times$ their 7 + $6 \times$ their 7 or 112	M1dep	oe
	136	A1	SC2 104
	Additional Guidance		
	SC2 is for using area of triangle is 6×4		

Q	Answer	Mark	Comments
22	Alternative method 1: solving for x		
	$x + 1 = x^2 - 7x + 10$	M1	oe
	$x^2 - 8x + 9 = 0$	M1dep	
	$(x =) \frac{8 \pm \sqrt{8^2 - 4 \times 9}}{2}$ or $(x =) 4 \pm \sqrt{7}$	M1	fit their three term quadratic equated to 0 but not $x^2 - 7x + 10 = 0$ oe in the form $x = \dots$
	$x = 1.4$ and $y = 2.4$ and $x = 6.6$ and $y = 7.6$ with at least M1 awarded	A2	A1 all four values in surd form or not correctly rounded or $x = 1.4$ and $y = 2.4$ or $x = 6.6$ and $y = 7.6$ or $(x =) 1.4$ and 6.6 or $(y =) 2.4$ and 7.6 and at least M1 awarded
	Alternative method 2: solving for y		
	$y = (y - 1)^2 - 7(y - 1) + 10$	M1	oe
	$y^2 - 10y + 18 = 0$	M1dep	
	$(y =) \frac{10 \pm \sqrt{10^2 - 4 \times 18}}{2}$ or $(y =) 5 \pm \sqrt{7}$	M1	fit their three term quadratic equated to 0 oe in the form $y = \dots$
	$x = 1.4$ and $y = 2.4$ and $x = 6.6$ and $y = 7.6$ with at least M1 awarded	A2	A1 all four values in surd form or not correctly rounded or $x = 1.4$ and $y = 2.4$ or $x = 6.6$ and $y = 7.6$ or $(x =) 1.4$ and 6.6 or $(y =) 2.4$ and 7.6 and at least M1 awarded

Q	Answer	Mark	Comments
23	$\begin{pmatrix} 6 & 0 \\ 0 & 6 \end{pmatrix}$	B2	B1 $\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$ or $\begin{pmatrix} 3 & 0 \\ 0 & 3 \end{pmatrix}$
	Additional Guidance		
	Condone multiplication of matrices in either order		

Q	Answer	Mark	Comments
24	(LQ =) 17 and (UQ =) 26 and (IQR =) 9	B3	B2 LQ in [11, 19] and UQ in [25, 35] and correct IQR for their LQ and UQ B1 LQ in [11, 19] and UQ in [25, 35] or correct IQR for their LQ and UQ, where their UQ > their LQ and both their UQ and their LQ are [11, 35]
	Additional Guidance		
	Use of both 11 and 35		B0

Q	Answer	Mark	Comments
25(a)	0.75	B1	oe
	m/s ²	B1	oe

Q	Answer	Mark	Comments
25(b)	Complete method to find area under the graph eg $\frac{1}{2} \times 20 \times 15 + (40 - 20) \times 15$ $+ \frac{1}{2} \times (15 + 13) \times (50 - 40)$ or $15 \times 50 - \frac{1}{2} \times 20 \times 15$ $- \frac{1}{2} \times (50 - 40) \times (15 - 13)$	M2	M1 method to find the area under the graph between any two x values eg $\frac{1}{2} \times 20 \times 15$ or 150 or $(40 - 20) \times 15$ or 300 or $\frac{1}{2} \times (40 + (40 - 20)) \times 15$ or 450 or $\frac{1}{2} \times (15 + 13) \times (50 - 40)$ or 140
	590	A1	

Q	Answer	Mark	Comments
26	$\frac{3\sqrt{2}-6}{10-7\sqrt{2}} \times \frac{10+7\sqrt{2}}{10+7\sqrt{2}}$	M1	oe rationalisation of the denominator
	$30\sqrt{2} + 42 - 60 - 42\sqrt{2}$ or $-18 - 12\sqrt{2}$	M1dep	oe terms in any order numerator
	$100 - 70\sqrt{2} + 70\sqrt{2} - 98$ or $100 - 98$	M1dep	oe terms in any order dep on first M1 denominator
	M3 awarded and $-9 - 6\sqrt{2}$ or $a = -9$ and $b = -6$	A1	
	Additional Guidance		
	Allow unprocessed terms for all M marks eg $10^2 - 7^2 \times 2$ or $100 - 7 \times 10\sqrt{2} + 70\sqrt{2} - 98$		
	$-6\sqrt{2} - 9$ with M3 awarded		M1M1M1A1

Q	Answer	Mark	Comments
27	Alternative method 1: using factors		
	Factor that would lead to $x = -0.5$ or $x = 3$	M1	eg $(x + 0.5)$ or $(2x + 1)$ or $(x - 3)$
	Product of factors that would lead to $x = -0.5$ and $x = 3$	M1dep	eg $(x + 0.5)(x - 3)$ or $x^2 - 3x + 0.5x - 1.5$ or $(2x + 1)(x - 3)$ or $2x^2 - 6x + x - 3$
	Answer of the form $a = 2k$ $b = -5k$ $c = -3k$ where k is a positive integer	A1	eg $a = 2$ $b = -5$ $c = -3$ or $a = 4$ $b = -10$ $c = -6$
	Alternative method 2: setting up equations		
	$0 = 3^2a + 3b + c$ and $0 = (-0.5)^2a - 0.5b + c$	M1	oe equations equated to 0
	Eliminate one variable and work out relationship between the two remaining variables	M1dep	eg $a = -\frac{2}{5}b$ or $a = -\frac{2}{3}c$ or $b = \frac{5}{3}c$
	Answer of the form $a = 2k$ $b = -5k$ $c = -3k$ where k is a positive integer	A1	eg $a = 2$ $b = -5$ $c = -3$ or $a = 4$ $b = -10$ $c = -6$
	Additional Guidance		
	Answer of the form $a = 2k$ $b = -5k$ $c = -3k$ where k is not a positive integer implies the second M mark in alt 2 eg $a = -2$ $b = 5$ $c = 3$	M1M1A0	

Q	Answer	Mark	Comments
28	$(4^x =) 2^{2x}$ or $(2^{19} =) 4^{9.5}$ or $(6^5 =) 2^5 \times 3^5$ or $(6^5 =) 4^{2.5} \times 3^5$ or $y = 5$	M1	
	$2x + 5 (= 19)$ or $x + 2.5 (= 9.5)$	M1dep	oe
	$x = 7$ and $y = 5$	A1	

Q	Answer	Mark	Comments
29	Alternative method 1		
	$\frac{6}{15} \times \frac{5}{14}$ or $\frac{30}{210}$ or $(2 \times) \frac{6}{15} \times \frac{9}{14}$ or $\frac{54}{210}$ or $\frac{108}{210}$	M1	oe
	$\frac{6}{15} \times \frac{5}{14} + \frac{6}{15} \times \frac{9}{14} + \frac{9}{15} \times \frac{6}{14}$ or $\frac{30}{210} + 2 \times \frac{6}{15} \times \frac{9}{14}$	M1dep	oe
	$\frac{138}{210}$ or $\frac{23}{35}$	A1	oe fraction, decimal or percentage eg 0.657(1...)
	Alternative method 2		
	$\frac{9}{15} \times \frac{8}{14}$ or $\frac{72}{210}$	M1	oe
	$1 - \left(\frac{9}{15} \times \frac{8}{14} \right)$ or 1 – their $\frac{72}{210}$	M1dep	oe
	$\frac{138}{210}$ or $\frac{23}{35}$	A1	oe fraction, decimal or percentage eg 0.657(1...)
	Additional Guidance		
	Ignore incorrect simplification after correct answer seen		
	If decimals are used they must be rounded to 3 dp or better		

Q	Answer	Mark	Comments
30	$3 \times 2 \times x^{3-1} + 2 \times 5 \times x^{2-1} (+ 0)$ or $6x^2 + 10x (+ 0)$	M1	oe eg $6 \times x^{3-1} - 10 \times x^{2-1}$
	their $(6x^2 + 10x) > 0$	M1	oe eg $6x^2 > -10x$ ft their derivative of the form $cx^2 + dx (+ e)$ with one of cx^2 and dx correct and $c \neq 0$ allow = or $\geq$ or $<$ or $\leq$
	$x(6x + 10) > 0$ or $(2)x(3x + 5) > 0$ or $x < -\frac{5}{3}$ or $x > 0$ or $-\frac{5}{3}$ and 0	M1dep	oe eg correct use of quadratic formula or completing the square ft correct method to solve their quadratic equation allow = or $\geq$ for $>$ allow = or $\leq$ for $<$ dep on 2nd M1 values may be seen on a sketch graph
	$x < -\frac{5}{3}$ and $x > 0$	A1	oe
	Additional Guidance		
	Accept -1.66 or better for $-\frac{5}{3}$		
	Working with < 0 (or ≤ 0) does not score 3rd M1 and cannot be recovered eg $6x^2 + 10x < 0$ $x(6x + 10) < 0$ $-\frac{5}{3}$ and 0		M1M1M0A0
	$6x^2 + 10x + 4 > 0$ $(6x + 4)(x + 1) > 0$ $x < -2$ and $x > -1$		M0M1M1A0