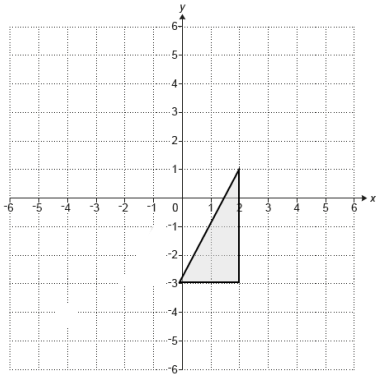
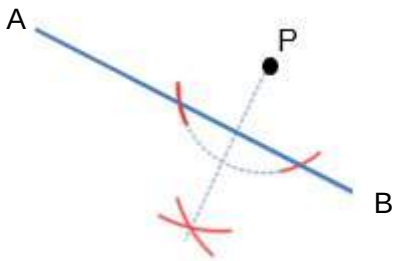
Question			Answer	Marks	Part Marks and Guidance	
1	(a)		<table><tr><th>×</th><th>3</th><th>4</th><th>5</th><th>6</th></tr><tr><td>3</td><td>9</td><td>12</td><td>15</td><td>18</td></tr><tr><td>4</td><td>12</td><td>16</td><td>20</td><td>24</td></tr><tr><td>5</td><td>15</td><td>20</td><td>25</td><td>30</td></tr><tr><td>6</td><td>18</td><td>24</td><td>30</td><td>36</td></tr></table>	1		
	(b)		$\frac{3}{16}$ oe	2FT	**Strict FT** *their* table for multiples of 8 **M1** for 16 and both 24s and any FT multiples of 8 identified with no extras or omissions or for $\frac{\textit{their } 3}{n}$ where $n \geq 13$	Do not accept ratio or words Accept 0.187[5], 0.188, 18.7[5]% or 18.8% If scoring fraction seen in body isw attempt to change form or cancel to final answer Note: If (a) is NR (b) $\frac{3}{16}$ scores **2** marks and $\frac{3}{n}$ where $n \geq 13$ scores **1** mark
2			Correct translation 	2	**B1** for a translation $\begin{pmatrix}3\\k\end{pmatrix}$ or $\begin{pmatrix}k\\-2\end{pmatrix}$ or three correct points not joined or three joined points one just out of tolerance	k can be 0 Mark intent (vertices within ±2 mm of correct position by eye) Ignore “counting” dots, intermediate position dots and dots on perimeter To be considered for the mark **one** point would need to be less than half way to the next gridline and the others in tolerance

Question			Answer	Marks	Part Marks and Guidance	
3	(a)		15	3	**M2** for $(1 - \frac{382.5[0]}{450})$ [× 100] oe or $\frac{450 - 382.5[0]}{450}$ [× 100] oe or $\frac{382.5[0] - 450}{450}$ [× 100] oe or **M1** for $\frac{382.5[0]}{450}$ [× 100] oe	Condone ⁻15 for **3** marks **M2** may be implied by ±0.15 or $\pm\frac{67.5}{450}$ or $\pm\frac{3}{20}$ **M1** may be implied by 0.85 or 85 or $\frac{17}{20}$ Non-calculator methods score **3** for correct answer or **M2** when equivalent to main scheme e.g. (second M2 method) 100(%) = 450 10(%) = 45 1(%) = 4.5 **M2** (450 – 382.5[0]) ÷ 4.5
	(b)		Vertical axis doesn't start from 0 oe or Jan price looks [less than] half Dec price oe or the difference between 382[.50] and 450 looks much bigger than it really is oe	1		Ignore • any reference to the horizontal axis • any insufficient reason that does not contradict the correct reason (if two reasons given) BUT, if two reasons offered and one reason clearly incorrect, mark the worst See Appendix

Question			Answer	Marks	Part Marks and Guidance	
4			One rectangle 8 cm by 4 cm	2	**B1** for one rectangle 8 by *n* or *m* by 4	Accept in any orientation, good freehand, tolerance for length ±2 mm by eye Additional shapes/lines or a net score **0** Other shapes/lines must be clearly deleted to allow **1** or **2** marks
5			They have ignored the [negative] powers oe 10^{-2} or 0.01 or $\frac{1}{100}$	1 1		See Appendix
6	(a)		69.5 [≤ *w* <] 70.5	2	**B1** for each If **0** scored **SC1** for • correct but reversed or • 69.50 [≤ *w* <] 70.50	
	(b)		Accept any correctly matched pair of values in which space < fridge from these ranges 69.5 ≤ space < 69.55 e.g. s = 69.5 and 69.5 < fridge < 69.55 f = 69.54	2	**B1** for one value for space or fridge where 69.5 ≤ space < 69.55 e.g s = 69.5 or 69.5 < fridge < 69.55 e.g. f = 69.51	Error interval (e.g. ...≤ space < ...) alone scores **0** Only mark candidate's chosen value(s) Measurements used must be clearly associated with space and/or fridge Space < fridge does not need to be stated For **B1** if one or multiple values for fridge/space seen and no clear choice all must be in correct ranges

7			250 with correct working	**6**	**M2** for $\frac{100-16}{9+5}$ × 9 oe or $\frac{100-16}{9+5}$ × 5 oe or **M1** for $\frac{100-16}{9+5}$ oe may be implied by 6 AND **B1** for 54 and 30 AND **M2** for (54 and 30 and 16) × $\frac{95}{54-16}$ oe or for $\frac{95}{54-16}$ × 100 oe or **M1** for $\frac{95}{54-16}$ oe may be implied by 2.5, 135, 75 or 40 If **0** or **1** scored, instead award **SC2** for 250 with no or insufficient working If **0** scored, instead award **SC1** for 54 or 30 with no or insufficient working	Correct working requires evidence of at least **M1**or**B1** AND **M1** Where there is a choice of method, mark the one that is progressed furthest May be seen with + signs, as a ratio, or as three separate products <u>Alternative second stage by trials</u> (in addition to any marks received for the first stage) **M2** for 135 : 75 : 40 or **M1** for 108 : 60 : 32 and 162 : 90 : 48 **<u>Algebra in terms of juniors *j*</u>** **M1** for $a = \frac{5}{9}j$ oe **M1** for $s = j - 95$ oe AND **M1** for $j - 95 = \frac{16}{100}(j - 95 + j + \frac{5}{9}j)$ oe or better **A1** for $j = 135$ **M1** for $s = 135 - 95$ implied by 40 and $a = \frac{5}{9} \times 135$ implied by 75

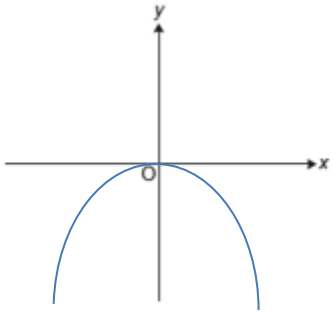
					Starting from ratio *j* : *a* is 9*x* : 5*x* **M2** for $9x - 95 = 0.16(9x + 5x + 9x - 95)$ oe or better **A1** for $x = 15$ or **M1** for $s = 9x - 95$ or $s = 0.16(9x + 5x + 9x - 95)$ oe or better AND **M2** for $23 \times 15 - 95$ oe or **M1** for $a = 5 \times 15$ implied by 75 or $j = 9 \times 15$ implied by 135 or $s = 9 \times 15 - 95$ implied by 40 If **0** or **1** scored, instead award **SC2** for 250 with no or insufficient working If **0** scored, instead award **SC1** for 15 with no or insufficient working **Algebra in terms of total *t*** **M1** for $s = 0.16t$ **M1** for $j = 0.16t + 95$ **M1** for $a = \frac{5}{9}(0.16t + 95)$ AND **M2** for $t = 0.16t + 0.16t + 95 + \frac{5}{9}(0.16t + 95)$ oe or better	**Algebra in terms of adults *a*** **M1** for $j = \frac{9}{5}a$ oe **M1** for $s = \frac{9}{5}a - 95$ oe AND **M1** for $\frac{9}{5}a - 95 = \frac{16}{100}(a + \frac{9}{5}a + \frac{9}{5}a - 95)$ oe or better **A1** for $a = 75$ **M1** for $j = \frac{9}{5} \times 75$ implied by 135 and $s = \frac{9}{5} \times 75 - 95$ implied by 40 **Algebra in terms of seniors *s*** **M1** for $j = s + 95$ oe **M1** for $a = \frac{5}{9}(s + 95)$ oe AND **M1** for $s = \frac{16}{100}(s + s + 95 + \frac{5}{9}(s + 95))$ oe or better **A1** for $s = 40$ **M1** for $j = 40 + 95$ implied by 135 and $a = \frac{5}{9}(40 + 95)$ implied by 75

Question			Answer	Marks	Part Marks and Guidance	
8			Ruled line through P and perpendicular to AB constructed with correct arcs (one pair intersecting AB)	2	**B1** for correct arcs (one pair intersecting AB) only or for correct ruled line but no, or incomplete, construction arcs  	Condone dotted lines Set protractor to 90° and check 88° to 92° at AB Correct construction arcs as shown (may be two pairs of arcs used to draw line through P) Ignore other arcs if correct arcs clearly used to construct line Condone perpendicular extending beyond AB but must pass through P and reach AB (no daylight) **Alternative (eg constructing a kite)** Arc centred on A length AP and arc centred on B length BP meeting below AB (may also pass through P). Candidates may use points on AB other than A and B for this construction. In such cases check radii of arcs using on-line ruler to judge See appendix for exemplars
9	(a)		7	3	**M2** for $8x - 6x = 3 + 11$ oe OR **M1** for $2x - 11 = 3$ or for $2x = k$ or for $8x = 14 + 6x$ or for $kx = 14$ **M1** for $x = \frac{b}{a}$ FT *their* $ax = b$ seen	Embedded 7 scores **M2** e.g. $8 \times \mathbf{7} - 11 = 6 \times \mathbf{7} + 3$ [= 45] identified as final working or written on answer line eg $2x = -8$ and answer line -4 with no other working scores **M1** and **M1FT**

Question			Answer	Marks	Part Marks and Guidance	
	(b)		$(x + 16)(x – 1)$	**M2**		Condone final bracket missing Accept $x + 16 = 0$ and $x – 1 = 0$ for **M2**
					M1 for $(x + a)(x + b)$ where $ab = ^-16$ or $a + b = 15$ or $x(x + 16) – [1](x + 16)$ or $x(x – 1) +16(x – 1)$	Allow correctly completed grid for **M1**
			$^-16$ and 1	**B1FT**	For correct solutions from their quadratic factors If **0** scored, instead award **SC1** for answers ±16 and ±1	$(x – 16)(x + 1)$ with answers $^-16$ and 1 scores **M1B0**

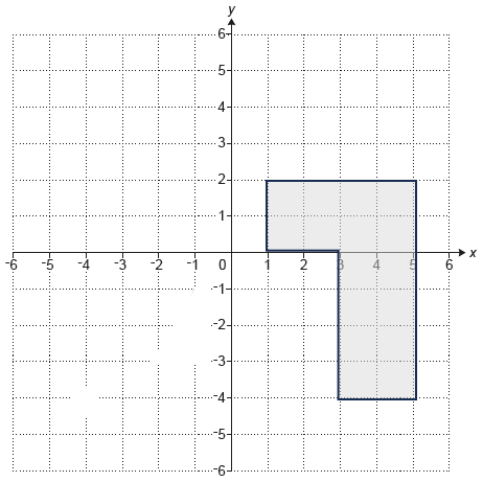
Question			Answer	Marks	Part Marks and Guidance	
10			$\sqrt{6\pi}$ or 4.34… with correct working	5	**B2** for 36π or 113 to 113.143 or **M1** for $4\pi 3^2$ oe AND **M2** for $\sqrt{\frac{their\ 4\pi 3^2}{6}}$ or **M1** for $6x^2$ may be implied by div by 6 <u>and</u> square root If **0**, **1** or **2** scored, instead award **SC3** for $\sqrt{6\pi}$ or 4.34… with no or insufficient working <u>Alternative method:</u> **M4** for $\sqrt{\frac{4\pi 3^2}{6}}$ or better or **M3** for $\sqrt{\frac{4\pi r^2}{6}}$ or better or **M2** for $\frac{4\pi r^2}{6}$ or better or **M1** for $6x^2$	Correct working requires evidence of at least **M1**or**B2** AND **M1** or alternative method **M2** *Their* value must come from correct substitution into sphere formula $\sqrt{\frac{\text{a positive value}}{6}}$ implies **M1** $\sqrt[3]{\frac{\text{a positive value}}{6}}$ implies **M0** After **B2** scored, correct final answer from trials scores full marks Note: $x^3 = 36\pi$ gives answer $x = 4.84$ (similar to correct answer 4.34)

Question			Answer	Marks	Part Marks and Guidance	
11			1250 nfww	**4**	**M3** for $\frac{1352}{1.04^2}$ oe or **M2** for $\frac{1352}{1.04}$ may be implied by 1300 or **B1** for 1.04 oe may be implied by 1.0816 or for 104[%] associated with 1352 or for 1352 = $P(1 + \frac{4}{100})^2$	May be performed in stages Continuing to find the interest (1352 – 1250 = 102) scores **M3** eg $\frac{104}{100}$ but not just $1 + \frac{4}{100}$ For **B1** allow fraction but not just 104% Note: 1352 ÷ 1.08 = 1251.85… corrected to 3 sf = 1250, scores **0**
12			39	**4**	**B2** for [*a* =] 1.5 oe or **M1** for 11 = 2 + 6*a* or better **M1** for $2 \times 6 + \frac{1}{2} \times$ *their a* $\times 6^2$ or better	 *their a* must come from use of *v = u + at*
13			20	**3**	**M2** for $\frac{8 \times 17.5}{5}$ oe may be implied by 28 or **M1** for $\frac{17.5}{5}$ oe or $\frac{8}{5}$ oe or for AC : 8 = 17.5 : 5	May be in stages Equivalents include 3.5, 1.6 etc
14			$2^6 \times 5^6 \times 7^5$	**3**	**B1** for 7^5 in answer **B1** for [$7^5 \times$] $2^k \times 5^k$ in answer, where *k* is a positive integer	Accept written in full without indices **B1B1** for $7^5 \times (2 \times 5)^6$

Question			Answer	Marks	Part Marks and Guidance	
15	(a)		$\frac{3}{5}$ and $\frac{2}{5}$ oe correct on top branch $\frac{4}{5}$ and $\frac{1}{5}$ oe correct on second branch	1 1		
	(b)		$\frac{7}{15}$ oe or 0.466 to 0.467	3	**M2FT** for $\left(\frac{4}{6}\times\frac{3}{5}\right)+\left(\frac{2}{6}\times\frac{1}{5}\right)$ oe or better or **M1FT** for $\left(\frac{4}{6}\times\frac{3}{5}\right)$ oe or $\left(\frac{2}{6}\times\frac{1}{5}\right)$ oe may be implied by $\frac{12}{30}$ oe or by $\frac{2}{30}$ oe	**FT** their probabilities from **(a)** Working may be seen next to diagram If answers to products seen, then + may be implied by final answer
16	(a)		Correct shape and orientation, reasonable symmetry in y-axis, intent to pass through origin  	2	**M1** attempt at correct curve shape and orientation not necessarily through the origin	See Appendix Should be a single smooth curve that appears symmetrical by eye For **M1** condone translation in any direction, minor feathering and curvature errors Plots should be curved and not straight-line segments

Question			Answer	Marks	Part Marks and Guidance	
	(b)		[y =] [k] tan x where $k > 0$	**1**		Condone [y =][k] tan x°, tan θ etc Do not accept [y =][k] tan, tan y, tan $\frac{o}{a}$, tan(a number) etc Ignore attempts at domain
17	**(a)**		75	**1**		
	(b)		11K and medians 15 and 15.5	**2**	**B1** for 11K with decision clearly supported by an attempted use of medians or for both medians correct	See Appendix For **2** marks, accept "average" and condone "mean" for median For **1** mark, use of "average/mean" must also have one correct median value Credit median values written on diagram only if referenced in their reason For **2** marks and **B1**, ignore mention of min/max/quartiles/IQR/range with correct or no values, as long as not an incorrect interpretation. If the interpretation is incorrect, or incorrect values are given, award **0** marks.

Question			Answer	Marks	Part Marks and Guidance	
18			2520	**4**	**M3** for (10 × 9 × 8 × 7) ÷ 2 oe or **M2** for 10 × 9 × 8 × 7 oe may be implied by 5040 or **M1** for $\frac{a}{10} \times \frac{b}{9} \times \frac{c}{8} \times \frac{d}{7}$ may be implied by $\frac{k}{5040}$ or $\frac{10}{a} \times \frac{9}{b} \times \frac{8}{c} \times \frac{7}{d}$ may be implied by $\frac{5040}{k}$ where *a*, *b*, *c*, *d* and $k \neq 1$ If **0** scored, instead award **SC1** for (10 × 10 × 10 × 10) ÷ 2 oe or for 9 × 8 × 7 × 6 [÷ 2] oe or for 9 × 9 × 8 × 7 [÷ 2] oe or for 10 × 9 × 8 × 5 or for 10 × 9 × 8 × 4	e.g. 5040 ÷ 2 or 5 × 9 × 8 × 7 For **M2** they must be working in whole numbers not fractions apart from probabilities as below 5040 in body via whole numbers subsequently spoilt: **M2** for 5040/*n*, otherwise **M1** Condone answers and working in probabilities to a max of **M3**: e.g. **M3** for answer $\frac{1}{2520}$ e.g. **M2** for $\frac{1}{10} \times \frac{1}{9} \times \frac{1}{8} \times \frac{1}{7}$ or $\frac{1}{5040}$ e.g. **SC1** for $\frac{1}{9} \times \frac{1}{8} \times \frac{1}{7} \times \frac{1}{6}$ [× 2]

Question			Answer	Marks	Part Marks and Guidance	
19				3	**B2** for shape of correct size and orientation in wrong position or **B1** for wrong size, correct orientation or for at least 3 correct vertices	See overlay; mark intent (±2 mm by eye), condone good freehand
20	(a)		18 × (7.5 – 0.5) or 18 × 7	1		126/18 = 7 only scores if 7 is related to the context 126/7 = 18 only scores if 18 is related to the context
	(b)		16.87[5] or 16.88 or 16.9 oe	4	**M3** for $\frac{126+2\times\frac{1}{2}\times0.5\ \times18}{8}$ oe or **M2** for $126+2\ \times\frac{1}{2}\times0.5\ \times18$ oe may be implied by 135 or **M1** for $[2\ \times]\ \frac{1}{2}\times0.5\ \times18$ oe may be implied by 4.5 for one triangle or 9 for two triangles If **0** scored, **SC1** for $\frac{126+2\times9}{8}$ or $\frac{126+18}{8}$	e.g. $\frac{\frac{1}{2}\times(7+8)\times18}{8}$ e.g. $\frac{1}{2}\times(7+8)\times18$ or $18\times8-2\ \times\frac{1}{2}\times0.5\ \times18$

Question			Answer	Marks	Part Marks and Guidance	
21			$(-\sqrt{7}, 3\sqrt{7})$ and $(\sqrt{7}, -3\sqrt{7})$ exact form only with correct working	5	**M3** for $x^2 = 7$ or **M2** for $x^2 + 9x^2 = 70$ or $10x^2 = 70$ or $10x^2 - 70 = 0$ or **M1** for $x^2 + (-3x)^2 = 70$ **A1** for $x = -\sqrt{7}$ and $\sqrt{7}$ or for one correct point If **0** or **1** scored, instead award **SC2** for $(-\sqrt{7}, 3\sqrt{7})$ and $(\sqrt{7}, -3\sqrt{7})$ with no or insufficient working If **0** scored, instead award **SC1** for both x values or for one correct point with no or insufficient working	Correct working requires evidence of at least **M2** For y values accept $\pm\sqrt{63}$ and for x values accept $\frac{\pm\sqrt{63}}{3}$ If $x = -\sqrt{7}$ and $\sqrt{7}$ seen after **M2**, award **M3A1** Condone omission of brackets if recovered For **A1** and **SC1**, condone -2.65 to -2.64, 2.64 to 2.65, -7.94 to -7.93, 7.93 to 7.94 Apply similar scheme for working in terms of y.

22			19.3[4…] to 19.3[7…] or 19.4 with correct working	**6**	**M2** for $[\frac{1}{2}\times]\sqrt{10.7^2 + 10.7^2}$ or for $\sqrt{5.35^2 + 5.35^2}$ or for $[\frac{1}{2}\times]\frac{10.7}{\cos 45}$ or $[\frac{1}{2}\times]\frac{10.7}{\sin 45}$ or for $\frac{5.35}{\cos 45}$ or $\frac{5.35}{\sin 45}$ or **M1** for $10.7^2 + 10.7^2$ or $5.35^2 + 5.35^2$ or for $\cos 45 = \frac{10.7}{AC}$ oe or $\sin 45 = \frac{10.7}{AC}$ oe or for $\cos 45 = \frac{5.35}{AO}$ oe or $\sin 45 = \frac{5.35}{AO}$ oe **A1** for 7.56 to 7.57 or 7.6 AND **M2** for $\frac{their\ 7.566...}{\cos 67}$ or $\frac{their\ 7.566...}{\sin 23}$ or $\frac{AE}{\sin 90} = \frac{their\ 7.566...}{\sin 23}$ or **M1** for $\cos 67 = \frac{their\ 7.566...}{AE}$ oe or $\sin 23 = \frac{their\ 7.566...}{AE}$ oe or $\frac{\sin 90}{AE} = \frac{\sin 23}{their\ 7.566}$ oe If **0**, **1** or **2** scored, instead award **SC3** for answer 19.3 to 19.4 with no or insufficient working If **0** or **M1** scored, instead award **SC2** for 7.56 to 7.57 or 7.6 with no or insufficient working If **0** scored instead award **SC1** for 15.1[3…] or 57.2… with no or insufficient working	Correct working requires evidence of at least **M1** AND **M1** Accept intermediate values rot to at least 3sf. If **M1A1** seen then award **M2A1** AO / AE 7.5 19.19478 7.56 19.34834 7.566 19.3637 7.566043 19.36381 7.57 19.37394 7.6 19.45072 *their* 7.566…must follow from the award of the first **M2** Mark less efficient methods by considering how many steps remain to reach the correct answer and match against the most comparable stage: eg Assuming AO has been found, then using trig to find EO is unnecessary and inefficient, so no further marks are awarded for just finding EO and stopping. However, if EO is then used in a correct Pythagoras expression with AO or a correct trig expression with 67˚ that lead directly or indirectly to finding AE, then **M2** or **M1** may be awarded.

Question			Answer	Marks	Part Marks and Guidance	
23			[a =] 98 [b =] 0.949[9…] or 0.95[0]	3	**B1** for [a =] 98 AND **B2** for [b =] 0.949[9…] or 0.95[0] or **M1** for $84 = 98b^3$ or better or $84 = ab^3$	**SC2** if correct answers transposed unless correctly identified in body

Question			Answer	Marks	Part Marks and Guidance	
24	(a)		$1^4 + 3(1)^2 - 2(1) - 5 = -3$ $2^4 + 3(2)^2 - 2(2) - 5 = 19$ Sign change so solution between $x = 1$ and $x = 2$	3	**M2** for $1^4 + 3(1)^2 - 2(1) - 5 = -3$ and $2^4 + 3(2)^2 - 2(2) - 5 = 19$ or **M1** for $1^4 + 3(1)^2 - 2(1) - 5$ or $2^4 + 3(2)^2 - 2(2) - 5$ soi by -3 or 19 <u>Alternative Method 1</u> After $x^4 + 3x^2 - 2x = 5$ seen **M2** for $1^4 + 3(1)^2 - 2(1) = 2$ and $2^4 + 3(2)^2 - 2(2) = 24$ **A1** for $24 > 5$ and $2 < 5$ so solution between $x = 1$ and $x = 2$ OR **M1** for $1^4 + 3(1)^2 - 2(1)$ or $2^4 + 3(2)^2 - 2(2)$ soi by 2 or 24 <u>Alternative Method 2</u> **SC3** for using an iterative equation that converges to a value in the range 1.25 to 1.35 **and** concluding statement that $1 < 1.25$ to $1.35 < 2$ oe or **SC2** for using an iterative equation that converges to a value in the range 1.25 to 1.35	Accept a minimum of $1 + 3 - 2 - 5 = -3$ and $16 + 12 - 4 - 5 = 19$ Accept other values of x used between 1 and 2 (see table in part (b)). For full marks, we need to see correct substitutions and evaluations that produce a sign change and a correct statement. For **M2**, we can see correct substitutions and evaluations, or two correct answers producing a sign change with a correct statement. Examples just sufficient for third mark include: • Sign change • $-3 < 0 < 19$ • $x = 1$ gives an answer < 0 and $x = 2$ gives an answer > 0 Examples insufficient for third mark: • so x lies between 1 and 2 If within part **(a)** a candidate refers to their iterative equation work in part **(b)** then award marks for Alternative Method 2.

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part Marks and Guidance</th><th></th></tr>
<tr><td></td><td>(b)</td><td></td><td>Two correct evaluations for $1.25 \le x \le 1.35$, one of which gives a positive answer and the other giving a negative answer

1.3</td><td>M3

A1</td><td>M2 for two correct evaluations for $1 < x < 2$, one which gives a positive answer and the other giving a negative answer
or
M1 for one correct evaluation for $1 < x < 2$

OR

If 0 scored instead award
SC1 for 1.3 with no worthwhile working

<u>Alternative Method by Iteration</u>
M1 rearranges to a correct iterative formula (converging or diverging, condone missing subscripts)
M1 attempts first iteration (either a substitution seen or evaluated to at least 2dp rot)
M1 continues further iteration(s) to reach x in the interval $1.25 \le x < 1.35$
A1 for 1.3</td><td>Likely values: accept rot to 1+sf
<table><tr><td>x</td><td>$x^4 + 3x^2 - 2x - 5$</td></tr><tr><td>1.1</td><td>-2.1059</td></tr><tr><td>1.2</td><td>-1.0064</td></tr><tr><td>1.25</td><td>-0.3710…</td></tr><tr><td>1.26</td><td>-0.2367…</td></tr><tr><td>1.27</td><td>-0.0998…</td></tr><tr><td>1.275</td><td>-0.0304…</td></tr><tr><td>1.28</td><td>0.0395…</td></tr><tr><td>1.285</td><td>0.1102…</td></tr><tr><td>1.3</td><td>0.3261</td></tr><tr><td>1.31</td><td>0.4732…</td></tr><tr><td>1.32</td><td>0.6231…</td></tr><tr><td>1.33</td><td>0.7757…</td></tr><tr><td>1.34</td><td>0.9309…</td></tr><tr><td>1.35</td><td>1.0890…</td></tr><tr><td>1.4</td><td>1.9216</td></tr><tr><td>1.5</td><td>3.8125</td></tr><tr><td>1.6</td><td>6.0336</td></tr><tr><td>1.7</td><td>8.6221</td></tr><tr><td>1.75</td><td>10.0664…</td></tr><tr><td>1.8</td><td>11.6176</td></tr><tr><td>1.9</td><td>15.0621</td></tr></table>
If a candidate refers to relevant working in part (a) then award up to full marks for part (b).</td></tr>
</table>

<table>
<tr>
<td>25</td>
<td></td>
<td></td>
<td>Proportion of black given round found as 0.6 oe
and
Proportion of black given square found as 0.64 oe

0.6 < 0.64 oe with both in comparable form</td>
<td>B5

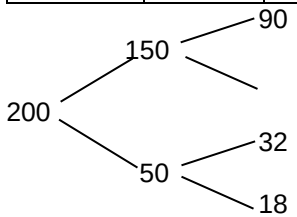
B1dep</td>
<td>B4 Proportion of black given round found as 0.6 oe
or
Proportion of black given square found as 0.64 oe

or

B3 Number or proportion of square black tiles found

or

M1 Round to square ratio of 3 : 1 used productively
M1 Number or proportion of round black and square white found (or, in the percentage method only 25 – 9 oe)

Eg working in decimals or probability
<table>
<tr><th>%</th><th>Black</th><th>White</th><th>Total</th></tr>
<tr><td>Round</td><td>0.45</td><td></td><td>0.75</td></tr>
<tr><td>Square</td><td>0.16</td><td>0.09</td><td>0.25</td></tr>
<tr><td>Total</td><td></td><td></td><td>1</td></tr>
</table>
B5 for 0.45/0.75 oe and 0.16/0.25 oe
or
B4 for 0.45/0.75 oe or 0.16/0.25 oe
or
B3 for 0.16 square black
or
M1 for 0.75 and 0.25
M1 0.45 and 0.09</td>
<td>All values may be seen in working or in diagrams/tables
Eg assuming number of tiles
<table>
<tr><th>Freq.</th><th>Black</th><th>White</th><th>Total</th></tr>
<tr><td>Round</td><td>90</td><td></td><td>150</td></tr>
<tr><td>Square</td><td>32</td><td>18</td><td>50</td></tr>
<tr><td>Total</td><td></td><td></td><td>200</td></tr>
</table>


B5 for 90/150 oe and 32/50 oe
or
B4 for 90/150 oe or 32/50 oe
or
B3 for 32 square black
or
M1 for150 and 50
M1 for 90 and 18
Eg working in percentages
<table>
<tr><th>%</th><th>Black</th><th>White</th><th>Total</th></tr>
<tr><td>Round</td><td>45</td><td></td><td>75</td></tr>
<tr><td>Square</td><td>16</td><td>9</td><td>25</td></tr>
<tr><td>Total</td><td></td><td></td><td>100</td></tr>
</table>
B5 for 45/75 oe and 16/25 oe
or
B4 for 45/75 oe or 16/25 oe
or
B3 for 16 square black
or
M1 for 75 and 25
M1 for 25 – 9</td>
</tr>
</table>