GCSE MARKING SCHEME

SUMMER 2022

GCSE
MATHEMATICS – COMPONENT 1
(HIGHER TIER)
C300UA0-1

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INTRODUCTION

This marking scheme was used by WJEC for the 2022 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

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EDUQAS GCSE MATHEMATICS

SUMMER 2022 MARK SCHEME

Component 1: Higher Tier	**Mark**	
1.* Both to £: 110 × 0.9(0) oe or 99 **and** 125 ÷ 1.25 oe or 100 OR € to £ and £ to $: 110 × 0.9(0) oe or 99 **and** 99 ×1.25 oe or 123.75 OR $ to £ and £ to €: 125 ÷ 1.25 oe or 100 **and** 100 ÷ 0.9(0) oe or 111.11… Germany indicated with (£)99 and (£)100 seen OR (£)99 and ($)123.75 seen OR (£)100 and (€)111.11 seen	M2 A1	Allow e.g. 1.25 × 100 = 125 for 125 ÷ 1.25; Allow M2 for e.g. 110 × 0.9(0) and 110 × 0.9(0) × 1.25 or 125 ÷ 1.25 and (125 ÷ 1.25) ÷ 0.9(0) (may be in stages) M1 for 110 × 0.9(0) oe or 99 or 125 ÷ 1.25 oe or 100 si Allow $123(...) OR $123 or $124 from correct working Allow €111(...)
	(3)	
2.* Second and fifth statements indicated and no others	B2	B1 for each if only two statements indicated OR for exactly three statements indicated of which two are correct
	(2)	

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3.*(a) $\frac{1}{3}\times\pi\times15^2\times30$ oe, si	M1	Allow e.g. 3.14 substituted for π; may be in stages
$\frac{1}{3}\times\pi\times225\times30$ oe, si	A1	Allow e.g. 3.14 substituted for π; may be in stages
2250π (cm^3)	A1	FT 'their 225', M1 A0 A1 is possible; Must be a multiple of π; do not ignore subsequent evaluation of e.g. 2250×3.14
3. (b) radius 3 cm or diameter 6 cm and height 6 cm si	B1	Correct use of the scale; may be implied by correctly drawn plan and elevation;
For the plan: draws a circle, radius 3cm and for the side elevation: draws an isosceles triangle with base 6 cm and height 6 cm	B3	FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their height = their base' For B3, circle must be drawn with compasses and triangle must be ruled. B2 FT for either an accurately drawn, correct plan or an accurately drawn, correct elevation FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their base' or 'their base = their height' or 'their diameter = their height' OR B2 FT for good sketches of both the correct plan and elevation or one sketch and one drawn accurately FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their height = their base' B1 for a circular plan with any radius or for a side elevation that is an isosceles triangle with any dimensions ; allow good freehand for B1 but base of triangle must not be clearly curved If B1 B0 or B0 B0, award SC1 for an accurate plan and elevation drawn in incorrect positions
	(7)	

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4.* (a) Uniform scale used on vertical axis Line starting at (0, 225) Single straight line with correct gradient si Ruled, single straight line ending at (45, 0)	 B1 B1 B1 B1	Plots accurate to within ½ a small square but mark intent Must allow plots up to 225 litres and start at zero According to their scale e.g. single straight line passing through any two of (10, 175), (20, 125), (30, 75), (40, 25), (45,0) according to their scale or line drawn using e.g. 50 litres = 10 minutes to plot and join points
4. (b) (225 ÷ 10) × 6 or 135 OR (225 ÷ 10) × 4 or 90 OR (225 ÷ 10) × 4 ÷ 5 or (45 ÷ 10) × 4 oe 18 (minutes)	 M1 A1	Ignore units if stated Equivalent calculations for M1 e.g. (50% + 10% =)112.5 + 22.5 or (50% - 10% =) 112.5 – 22.5 if 90 or 135 found and using **correct** graph accept 17 – 19 mins FT 'their single straight line' read at a volume = 135 providing that it has negative gradient; allow good freehand here Accept 18 mins even if graph incorrect as can be done without it e.g. 90 ÷ 5 18 (mins) without working implies M1 A1
	(6)	
5.*(a) 0.7 AND 0.9 correctly placed	 B1	
5. (b) 0.6 × 0.3 oe 0.18 oe	 M1 A1	 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect
5. (c) 0.4 × 0.1 oe 0.04 oe	 M1 A1	 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect
	(5)	

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6.* 2(h) or 120 (min) $\times$ 6 $\div$ 3 $\div$ 8 oe OR (8 machines 3000 $\div$ 2 $\div$ 6 $\times$ 8 =) 2000 erasers per hour or better ½ (hour) or 30 (mins)	 M2 A1	Operations may be done in any order and in stages For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ M1 for partial correct method using time and using any two correct operations and no wrong operations OR M1 for 3000 $\div$ 2 $\div$ 6 $\times$ 8 or 3000 $\div$ 120 $\div$ 6 $\times$ 8 oe If units are given they must be correct
Alternative method *Complete method e.g.* *Machines* / *Erasers* / *Hours* *6* / *3000* / *2* *2* / *1000* / *2* *8* / *1000* / *½* *or* *Machines* / *Erasers* / *Hours* *6* / *3000* / *2* *8* / *4000* / *2* *8* / *1000* / *½* *½ (hour) or 30 (mins)*	*M2* *A1*	*Correct step(s) to 1000 and correct step(s) to 8 or e.g.* *Machines* / *Erasers* / *Hours* *6* / *3000* / *2* *1* / *500* / *2* *1* / *250* / *1* *and (time needed is to make)1000 $\div$ 8 = 125 (erasers per machine) oe* *M1 for finding 1 machine makes 250 erasers per hour or (time needed is to make)1000 $\div$ 8 = 125 (erasers per machine) or any one correct step* e.g. *Machines* / *Erasers* / *Hours* *6* / *3000* / *2* *1* / *500* / *2* *If units are given they must be correct*
	(3)	

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7.*(a) $8x^2 - 4x + 10x - 5$ $8x^2 + 6x - 5$	B2 B1	B1 for any two terms correct; $nx^2 + 6x + m$ implies two terms correct if not from wrong working Implies previous B2; FT for equivalent level of difficulty, providing a quadratic expression with 4 terms to consider and like terms in x to collect with opposite signs mark final answer except ignore '=0'
7. (b)(i) $(x - 3)(x - 7)$ oe	B2	If not B2, award B1 for $(x \ldots 3)(x \ldots 7)$ or for $x(x - 7) - 3(x - 7)$ oe; ignore '= 0' If no marks, award SC1 for factors $x - 3$ and $x - 7$ stated but not as a product
7. (b)(ii) $x = 3, x = 7$	B1	**STRICT FT** from 'their $(x \ldots a)(x \ldots b)$' where a and b are constants;
	(6)	

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8.*(a) (Proportion of marked moths in sample is) $\frac{9}{12}\left(=\frac{3}{4}\right)$ oe, si or (Proportion of 2nd sample marked is) $\frac{9}{30}\left(=\frac{3}{10}\right)$ oe, si Correct completion e.g. $\frac{9}{30}=\frac{12}{40}$ (so 40 moths) OR $\frac{9}{12}=\frac{30}{40}$ (so 40 moths) OR 75% (of population) is 30 (moths) so 100% (of population) is 30 + 10 = 40 (moths) oe	B1 B1	Allow for e.g. '9 out of 12 (marked)' or '9 (marked) out of 30' allow for sight of e.g. $\frac{12\times30}{9}(=40)$ Implies the first B1; Allow for • showing '12 out of 40' and '9 out of 30' are both '3 out of 10' or • $\frac{9}{12}=\frac{30}{x}$ and $9x = 360$, $x = 40$ oe NB $\frac{12\times30}{9}=\frac{360}{9}=40$ is B2
8. (b) Valid comment based on sample or population size e.g. 'It may not be very reliable as he only captured 12 moths in his first sample.' or 'Some of the moths may have been eaten so the results may not be accurate.'	E1	Allow e.g. 'Not reliable because the population would be bigger at different times of the year.' Allow comments which refer to the experiment needing to be repeated E1 for e.g. 'Somewhat reliable because it was done once and it could be different if repeated again' or 'Not reliable as he needs to do it more often.' Must not contain contradictions/errors but may contain irrelevant statements E0 for e.g. 'Not very reliable as there could have been more moths.' or 'Unlikely (to be reliable) because it has only been tested twice' or 'Not reliable because he could keep catching the same moths over and over.'
	(3)	

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9. Use of 110% (of original price) is 8690	S1	e.g. $x \times 1.1 = 8690$
A calculation for an appropriate percentage of the original price e.g.(10% of original price is) $\frac{8690}{11}$ or (1% of original price is) $\frac{8690}{110}$ or (original price is) $\frac{8690}{1.1}$ oe	B1	Need not evaluate calculation but the calculation stated must be the correct one for the % claimed; may be in stages
(£)7900	B1	CAO; implies 3 marks
	(3)	
10.(a) Method to find prime factors with two correct prime factors seen	M1	Implied by 2, 3, 3, 3, 7; ignore 1s
2, 3, 3, 3, 7	A1	CAO. For sight of the 5 correct factors (Ignore 1's); may be in e.g. a factor tree
$2 \times 3^3 \times 7$	B1	FT 'their derived primes' provided at least one index form used with at least a square **dep** on M1 previously awarded Allow $(2)(3^3)(7)$ and $2.3^3.7$ Inclusion of 1 as a factor gets B0.
(b) $378 = 2 \times 3^3 \times 7$ or 2, 3, 3, 3, 7 **AND** $275 = 5 \times 5 \times 11$ or finds prime factors of 275 as 5, 5, 11 OR shows that 2, 3 and 7 are not factors of 275 OR shows that 5 and 11 are not factors of 378 **AND** a valid comment e.g. 'They have no prime factors in common' oe	B2	$378 = 2 \times 3^3 \times 7$ or 2, 3, 3, 3, 7 may be seen in (a) Valid comments: **allow** e.g. 'They have no factors in common (except 1).' *or 'They only have 1 in common'*; **do not allow** e.g. '1 is the only common prime factor' B1 for partially correct proof e.g. • $275 = 5 \times 5 \times 11$ OR • Showing/stating that 2, 3 and 7 are not factors of 275 OR • Showing/stating that 5 and 11 are not factors of 378
	(5)	

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11. (a)(i) Attempts **OR** – **OP** $\begin{pmatrix} 4 \\ -4 \end{pmatrix}$ as final answer	 S1 B1	 Evidence may be seen on grid Not from wrong working
(a)(ii) Attempts **OP** + **OR** $\begin{pmatrix} 6 \\ 2 \end{pmatrix}$ as final answer	 S1 B1	 Evidence may be seen on grid If grid used, FT 'their points **P** and **R'** used consistently
(b) Two valid criticisms e.g. 'The directions of the vectors are missing.' **and** '**b** has been drawn in the wrong direction.' or 'The 2**a** has been drawn in the wrong direction.' or 'He has drawn 2**a** – **b**.'	 E2	 E1 for one valid criticism
	(6)	
12. (a) 6 parts = 48 or 48 ÷ 6 or $13x - 7x =$ 48 oe (1 part =) 8 oe, si (Total =) 8 × (13 + 7 + 2) or (Total =) 104 + 56 + 16 176	 M1 A1 m1 A1	 Accept '$\frac{6}{22}$ is 48 ' oe; for 'their 8' × 'their (13 + 7 + 2)' or for 'their 8'× 13 + 'their 8' × 7 + 'their 8' × 2 or for sight of any two of 104 or 56 or 16 FT 'their 8'
Alternative method *e.g. Solves simultaneously* *A = 48 + B , 7A = 13B* *B = 56* *A = 48 + 56 (= 104)* *and* *uses 7C = 2B to find* *C = 2 × 56 ÷ 7 (= 16)* *leading to 56 + 104 + 16 oe* *176*	 *M1* *A1* *m1* *A1*	***Using simultaneous equations:*** *e.g. 7(48 + B) = 13B* *FT 'their 56, their 104 and their 16'* *FT 'their 56'*
(b) $\frac{1000}{xf}$ oe (km/l) ISW	 B1	 Allow e.g. $\frac{1000}{x} \div f$
	(5)	

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13. $(2.16\times10^7) \div (3\times10^3)$ or $21\,600\,000 \div 3000$	M2	M1 for $(2.16\times10^7) \div 3000$ or an appropriate division with a place value error e.g. $216\,000\,000 \div 3000$; implied by figs 72
7200 (people/km^2) or 7.2×10^3	A1	CAO; accept 0.72×10^4 Do not ignore further incorrect working e.g. $7.2 \times 10^3 = 72\,000$ is A0
Y indicated and (8000 – 7200 =) 800 (people/km^2)	B1	FT 'their 7200' and the country that matches their values provided at least M1 previously awarded; answer must be given as an integer or correctly expressed in standard form.
	(4)	
14.		FT until second error; marks may be awarded in a different order
$a^3b + 35 = 7c$ or $\frac{a^3b}{7} = c - 5$	B1	
$a^3b = 7c - 35$ or $a^3b = 7(c-5)$	B1	
$a^3 = \frac{7c-35}{b}$ or $a^3 = \frac{7(c-5)}{b}$	B1	
$a = \sqrt[3]{\frac{7c-35}{b}}$ or $a = \sqrt[3]{\frac{7(c-5)}{b}}$	B1	Mark final answer
	(4)	

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15. $P\hat{S}O$ = (180 – 130) ÷ 2 or 25° (base angle isosceles triangle) $P\hat{S}R$ = 180 – 120 or 60° (opposite angles in a cyclic quadrilateral) $O\hat{S}R$ = 60 – 25 oe or 35° ($P\hat{S}R = P\hat{S}O + O\hat{S}R$) OR $T\hat{S}P$ = 90 – 25 or 65° (tangent perpendicular to radius) x = 90 – 35 oe (= 55°) (tangent perpendicular to radius) OR x = 180 – 125 (= 55°) At least 'opposite angles in a cyclic quadrilateral' oe and 'tangent perpendicular to radius' oe appropriately stated.	 B1 B1 B1 B1 E1	Angles may be marked on diagram. Degrees symbol may be omitted throughout. FT 'their derived 25' and 'their derived 60' providing B1 already awarded; sight of 35 does not imply the previous mark CAO; must have earned all previous marks
		If working back using the 55 award SC3 for 90 – 55 = 35 oe (tangent perpendicular to radius) $P\hat{S}O$ = (180 – 130) ÷ 2 or 25° (base angle isosceles triangle) $P\hat{S}R$ = 25 + 35 or 60 $P\hat{S}R$ = 180 – 120 = 60° or $P\hat{Q}R$ = 180 – 60 = 120 (opposite angles in a cyclic quadrilateral) or SC2 for any two or three of the 4 correct statements or SC1 for any one correct statement and E1 for reasons as above
	(5)	

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16.(a)(i) 0.1, 0.8, 0.4, 1.3, 0.25	B2	Allow fractions e.g. $\frac{5}{50}, \frac{8}{10}, \frac{12}{30}, \frac{13}{10}, \frac{5}{20}$ B1 for 3 or 4 correct Table takes precedence
(a)(ii) Fully correct histogram	B2	FT candidate's frequency density if table has arithmetic errors but the idea of frequency density is used e.g. $\frac{5}{50}, \frac{8}{10}, \frac{12}{30}, \frac{13}{10}, \frac{5}{20}$ si B1 for 3 or 4 correct bars; no gaps
(a)(iii) $\frac{17}{43}$	B2	B1 for $\frac{5+8+(12\div 3)}{43}$ oe OR B1 for 5 + 8 + 4 or 17 seen
(b) $0.4\times 50 + (1\times)\ 10 + 0.3\times 40 + 0.2\times 20$ 46	M1 A1	20 + 10 + 12 + 4 si; allow one error
(c) Brian indicated with a supporting comparison. e.g. 'Brian has 30 trees less than 260 cm Yvonne has 13.' or 'Yvonne has 5 of the smallest trees and Brian has 20'	E1	FT 'their (b)'; dep on at least M1 in part (b) Allow e.g. 'Brian because he has more trees that are below 260 cm' or 'Brian as he has a greater probability of having trees less than 270' or 'Brian as Yvonne has fewer trees less than 260' or 'Brian has (their) 20 and Yvonne has 5 in the smallest group' Do not allow e.g. 'Brian because most of his trees are shorter than most of Yvonne's' or 'Brian as he has a larger amount of shorter trees'
	(9)	

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17. $(h=)\sqrt{3}x$	B4	B3 for $h^2=3x^2$ or $(h=)\sqrt{3x^2}$ OR $(h=)\frac{2x\sqrt{3}}{2}$ B2 for $(2x)^2-x^2=h^2$; accept e.g. $(h=)\sqrt{(2x)^2-x^2}$ OR $\frac{h}{2x}=\frac{\sqrt{3}}{2}$ OR $h^2=(2x)^2+x^2-\frac{2(2x)(x)}{2}$ or $(h=)\sqrt{(2x)^2+x^2-\frac{2(2x)(x)}{2}}$ allow e.g. $(h=)\sqrt{2x^2-x^2}$ or $h^2=2x^2-x^2$ or $(2x)^2-y^2=h^2$ OR $h^2=2x^2+x^2-\frac{2(2x)(x)}{2}$ or $(h=)\sqrt{2x^2+x^2-\frac{2(2x)(x)}{2}}$ B1 for $x^2+h^2=(2x)^2$; allow e.g. $x^2+h^2=2x^2$ or $y^2+h^2=(2x)^2$ or $2x^2-y^2=h^2$ or $(h=)\sqrt{2x^2-y^2}$ OR sin60° = $\frac{\sqrt{3}}{2}$ or sin60° = $\frac{h}{2x}$ OR cos30° = $\frac{\sqrt{3}}{2}$ or cos30° = $\frac{h}{2x}$ OR $h^2=(2x)^2+x^2-2(2x)(x)\cos 60$ or $(h=)\sqrt{(2x)^2+x^2-2(2x)(x)\cos 60}$ or $h^2=2x^2+x^2-2(2x)(x)\cos 60$ or $(h=)\sqrt{2x^2+x^2-2(2x)(x)\cos 60}$
	(4)	

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18.(a) 5^7	B1	mark final answer
(b) $\left(\sqrt[4]{10000}\right)^3$ or $\sqrt[4]{10000^3}$ si 1000	B1 B1	First correct step implied by sight of 10^3 or $\sqrt[4]{1\ 000\ 000\ 000\ 000}$
(c) 7×10^n	B2	B1 for $49^{\frac{1}{2}} \times (10^{2n})^{\frac{1}{2}}$ or $\sqrt{49} \times (10^{2n})^{\frac{1}{2}}$ oe
	(5)	
19.(a) $0\cdot\dot{0}3\dot{7}$ ISW	B1	Allow 0·037037... or $0\cdot\dot{0}3\dot{7}$ or $0\cdot3\dot{7}\dot{0}$
(b) $1000x - 10x = 1243\cdot\dot{4}\dot{3} - 12\cdot\dot{4}\dot{3}$ $(990x = 1231)$ oe, si; OR (1·2 plus) $1000x - 10x = 43\cdot\dot{4}\dot{3} - 0\cdot\dot{4}\dot{3}$ (1.2 plus) $(990x = 43)$ oe, si $\frac{1231}{990}$ $\frac{1231}{990} - \frac{880}{990}$ $\frac{351}{990}$ oe, ISW	M1 A1 m1 A1	Allow for $100x - x = 124\cdot3\dot{4}\dot{3} - 1\cdot2\dot{4}\dot{3}$ $(99x = 123.1)$ oe, si CAO; may be embedded e.g. $\frac{1231}{990} - \frac{8}{9}$; implies M1 STRICT FT 'their $\frac{1231}{990}$' or '$\frac{1188}{990}$ + their $\frac{43}{990}$' CAO $\frac{39}{110}$
	(5)	
20. (a) $h\left(\frac{1}{6}\right)$ or $\left(\frac{1}{6}\right)^3$ OR $hg(x) = \frac{x^3}{8}$ oe $\frac{1}{216}$	M1 A1	must be $\frac{1}{6}$ OR Accept e.g. $hg(x) = \left(\frac{x}{2}\right)^3$ *Allow e.g.* $hg \rightarrow \left(\frac{x}{2}\right)^3$ *or any clear indication they know what the function is* If no marks, SC1 for 'their $\frac{1}{\frac{3}{2}}$' correctly cubed, as final answer providing they have shown $\frac{1}{\frac{3}{2}}$ or exact equivalent
(b) $h^{-1}(x) = \sqrt[3]{x}$ or $x = h(-2)$ or $(-2)^3$ $(x =) -8$	M1 A1	
	(4)	

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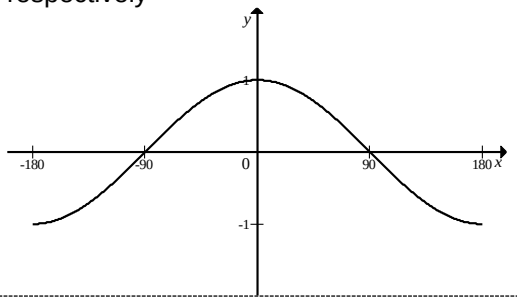
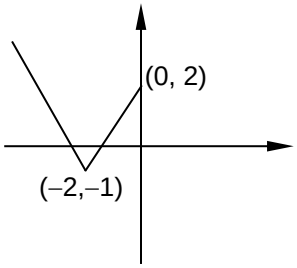
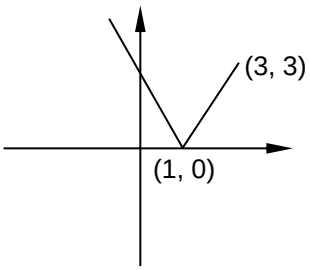
21.(a)(i) Correct cosine graph over full domain with minima and maximum at -1 and 1 respectively  	B2	B1 for correct shape over full domain but 1 and -1 not marked OR for correct roots, minima and maximum but incorrect shape e.g. ruled sections OR for the correct curve from at least 0° to 180° with 1 and -1 marked
(a)(ii) 30° , $-30°$	B2	And no extras in range B1 for either, ignoring extras; if no marks, award SC1 for stating cos30 = $\frac{\sqrt{3}}{2}$
(b)(i) Translation through $\begin{pmatrix}0\\k\end{pmatrix}$, where $k < 0$ Correct coordinates seen or scale marked	B1 B1	Allow good freehand 
(b)(ii) Translation through $\begin{pmatrix}k\\0\end{pmatrix}$, where $k > 0$ Correct coordinates seen or scale marked	B1 B1	Allow good freehand 
	(8)	
22.(a) $\frac{2}{5}\times\frac{1}{4}$ oe $\frac{2}{20}$ oe, ISW	M1 A1	not from wrong method
(b) $\left(1-\frac{2}{20}\right)\times\frac{2}{20}$ oe $\frac{36}{400}$ oe, ISW	M1 A1	FT 'their derived $\frac{2}{20}$' providing it is not $\frac{2}{5}$ or $\frac{1}{5}$ CAO
	(4)	

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23.(a) $35 \times 3 - 28\sqrt{3} + 3\sqrt{3}$ or better	M2	with at most one sign or arithmetic slip M1 for any one of 105, $-28\sqrt{3}$, $3\sqrt{3}$ si
$105 - 25\sqrt{3}$	A1	Allow e.g. $-25\sqrt{3} + 105$;
(b) $2(6-\sqrt{2})+x\times 5\sqrt{2} \quad (=33\sqrt{2}-18)$ si	B1	or $2(6-\sqrt{2}-x)+x(5\sqrt{2}+2) \quad (=33\sqrt{2}-18)$ si omitted brackets may be recovered in later work
Forms a correct equation for the area **and** either isolates *x* term: $5x\sqrt{2}=33\sqrt{2}-18-12+2\sqrt{2}$ or collects terms: $30+5x\sqrt{2}=35\sqrt{2}$	M1	FT 'their $2(6-\sqrt{2})+x\times 5\sqrt{2}$' $=33\sqrt{2}-18$ oe providing expression is dimensionally correct for an area and at most one error in the expression; allow one further error in forming and rearranging the equation e.g. sign, bracketing or arithmetic slip correct equation implies the B1
$(x=)\ \frac{35\sqrt{2}-30}{5\sqrt{2}}$ or $(x=)\ 7-\frac{6}{\sqrt{2}}$	A1	FT;
$(x=)\ \frac{35\sqrt{2}-30}{5\sqrt{2}}\times\frac{5\sqrt{2}}{5\sqrt{2}}$ or $(x=)$ $7-\frac{6}{\sqrt{2}}\times\frac{\sqrt{2}}{\sqrt{2}}$ oe	M1	FT 'their expression with irrational denominator' providing 1 mark previously awarded
$(x=)\ 7-3\sqrt{2}$	A1	CAO; Mark final answer
	(8)	
24. (a) 20 (units)	B1	Ignore any units if stated
(b) *B*(–12, 16)	B2	Allow brackets omitted; allow $x = -12$, $y = 16$ B1 for each coordinate OR B1 for $(12 - 24, -16 + 32)$ oe seen OR B1 for $(-12)^2 + 16^2 = 400$ If no marks award SC1 for a sketch of a circle , centre (0, 0) with A marked in the correct quadrant
	(3)	

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25. $\frac{v-6}{15-5}$	S1	Forms a gradient in terms of v
$\frac{v-6}{15-5}=0.5$	M1	FT 'their $\frac{\text{vertical diff}}{\text{horizontal diff}}$'; implies the S1
(v =) 11 (m/s)	A1	
Alternative method 1 *$v=u+at$ with $u = 6$, $a = 0.5$, $t = 10$*	*S1*	
6 + (0.5)(10)	*M1*	*Implies the S1*
(v =) 11 (m/s)	*A1*	
Alternative method 2 *Right-angled triangle drawn with horizontal 10 marked or use of* $a=\frac{\text{change in } v}{\text{change in } t}$	*S1*	
0.5 × 10 (+ 6)	*M1*	*Implies the S1*
(v =) 11 (m/s)	*A1*	
Alternative method 3 *$v = 0.5t + 3.5$*	*S1*	Finds the equation of the line; allow in terms of y and x: $(y=v, x=t)$ $y=0.5x+c$ $6=0.5(5)+c$ $c=3.5$
v = 0.5(15) + 3.5	*M1*	
(v =) 11 (m/s)	*A1*	
	(3)	

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