1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1		$\frac{\sqrt{20.4}}{6.2\times0.48}=\frac{4.5166359}{2.976}$	1.5176(868)	2	B2 for 1.5176… (B1 for sight of 4.51(66359..) **or** 4.52 **or** 2.97(6) **or** 2.98 **or** 1.51 **or** 1.52 **or** 1.518 **or** 1.517 **or** 1.5177**or** $\frac{\sqrt{510}}{5}$)
2	(a)		Triangle with vertices (1, 5) (4, 5) (4,7)	2	B2 correct reflection (B1 a translation of the correct answer with the final shape above $y = x$ **or** any two correct vertices) SC : B1 for a triangle with vertices at (2, 5) (4, 5) (4, 8)
	(b)		Translation by $\begin{pmatrix}-2\\-4\end{pmatrix}$	2	B1 Translation B1 $\begin{pmatrix}-2\\-4\end{pmatrix}$ NB. Award no marks for a combination of transformations

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
*3		3×£193.86 = £581.58 £581.58 ×0.85=£494.343	£494.34	5	M1 3 × 193.86 (= 581.58) B1 ft correct discount % identified or used in working (may be identified in table) M1 '581.58'× '0.15' (=87.23(7)) M1 (dep on the previous M1) '581.58' − '87.23(7)' (= 494.34(3) **or** 494.35) C1 (dep on all method marks) for £494.34 **or** £494.35 identified as final answer with correct money notation **OR** M1 3 × 193.86 (= 581.58) B1 ft correct discount % identified or used in working (may be identified in table) M2 '581.58'× '0.85' **(=** 494.34(3)) (M1 '581.58' × '1.15' (=668.81(7)) C1 (dep on all method marks) for £494.34 **or** £494.35 identified as final answer with correct money notation **NB. Throughout, values may be rounded or truncated to 2 decimal places**

1MA0_2H

Question		Working	Answer	Mark	Notes
4		<table><tr><th>Bird</th><th>Frequency</th><th>Angles</th></tr><tr><td>Magpie</td><td>15</td><td>75</td></tr><tr><td>Thrush</td><td>10</td><td>50</td></tr><tr><td>Starling</td><td>20</td><td>100</td></tr><tr><td>Sparrow</td><td>27</td><td>135</td></tr></table> Angles $\frac{15}{72}\times 360$, $\frac{10}{72}\times 360$, $\frac{20}{72}\times 360$, $\frac{27}{72}\times 360$ OR $360 \div 72 = 5$ $5 \times 15 = 75$ etc	Correct pie chart	3	M1 for any one of $\frac{15}{'72'}\times 360$, $\frac{10}{'72'}\times 360$, $\frac{20}{'72'}\times 360$, $\frac{27}{'72'}\times 360$ oe ('72' must clearly come from adding frequencies) A1 for 75 seen from correct working **or** 50 seen **or** 100 seen **or** 135 seen **or** one sector of angle 50^o or 100^o or 135^o labelled correctly with bird's name **or** all sectors correctly drawn A1 for correct pie chart fully labelled with birds' names **OR** M1 for $\frac{'75'}{15} \times 10$ **or** $\frac{'75'}{15} \times 20$ **or** $\frac{'75'}{15} \times 27$ ('75' should be in the range 73 - 77) A1 for 50 seen **or** 100 seen **or** 135 seen **or** one sector of angle 50^o or 100^o or 135^o labelled correctly with bird's name **or** all sectors correctly drawn A1 for correct pie chart fully labelled with birds' names **NB. Allow a tolerance of $\pm 2^o$ on all drawn angles**

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
5		25 ÷ 50 = 0.5 h = 30 min 25 ÷ 60 = 0.416 h = 25 min	5	3	M1 for 25 ÷ 50 **or** $\frac{60}{50}\times 25$ **or** 30 (min) **or** 0.5(h) **or** 25 ÷ 60 **or** $\frac{60}{60}\times 25$ **or** 25 (min) **or** 0.41(6)(h) **or** 0.42 (h) M1(dep) '0.5' –' 0.416 '**or** '30' – '25' A1 cao **OR** M1 for 60 ÷ 25 (= 2.4) **and** 60 ÷ "2.4" **or** 50 ÷ 25 (= 2) **and** 60 ÷ "2" M1(dep) '30' – '25' A1 cao

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
6		Angle *DEC* = 180 – 41 =139 Angles on a straight line sum to 180° Angle *EDC* = 60 – 38 **or** Angle *ABD* = 180 – 120 – 38 (=22) Co-interior/allied angles of parallel lines sum to 180° **or** Angles in a triangle sum to 180° **and** Alternate angles *x* =)180 – '139' – '22' (=19) Angles in a triangle sum to 180° **OR** Angle *ADC* = 180° – 120° = 60° Co-interior/allied angles of parallel lines sum to 180° Angle *EDC* = 22° Angle *ECD* = 41° – 22° = 19° Exterior angle of triangle equals sum of the two opposite interior angles **OR** Angle *DBC* = 38° Alternate angles Angle *BCE* = 101° Angle sum of a triangle is 180° Angle *BCD* = 120° Opposite angles of a parallelogram are equal Angle *ECD* = 120° – 101° = 19°	*x* = 19° and reasons	4	M1 for *DBC* = 38° **or** *ADC* = 60°(can be implied by *BDC* = 22°) **or** *ABC* = 60° **or** *DCB* = 120° **or** (*ABD* =) 180 – 120 –38 (=22) M1 for (*BDC* =) 60 − 38 (=22) **or** *BDC* = '22' **or** (*DEC* =) 180 − 41 (=139) **or** (*BCE* =) 180 −41 − 38 (=101) M1 (dep on both previous M1) for complete correct method to find *x* **or** (*x* =) 19 C1 for *x* = 19° **AND** Co-interior/allied angles of parallel lines sum to 180° **or** Opposite angles of a parallelogram are equal **or** Alternate angles **AND** Angles on a straight line sum to 180° **or** Angles in a triangle sum to 180° **or** Exterior angle of triangle equals sum of the two opposite interior angles **or** Angles in a quadrilateral sum to 360°

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
7		17.8 ÷ 160 × 210 = 0.11125 × 210 = 23.3625 g **OR** 210 ÷ 160 × 17.8 = 1.3125 × 17.8 = 23.3625 g **OR** 210 − 160 (=50) $\frac{17.8}{160}\times'50'(=5.5625)$ 17.8 + 5.5625	23.3(625)	3	M1 17.8 ÷ 160 (=0.11125) **or** 17.8 × 210 (=3738) **or** 210 ÷ 160 (=1.3125) M1 (dep) '0.11125' × 210 **or** '3738'÷160 **or** '1.3125'× 17.8 A1 for answer in range 23.3 - 23.4 **OR** M1 for $\frac{17.8}{160}\times(210-160)(=5.5625)$ M1 (dep) for 17.8 + '5.5625' A1 for answer in range 23.3 - 23.4 **OR** M1 for correct method to find weight of 2 cm **or** 5 cm **or** 10 cm M1 (dep) for complete method A1 for answer in range 23.3 - 23.4

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		–1, 0, 1, 2, 3	2	B2 for all 5 correct values; ignore repeats, any order (B1 for 4 correct (and no incorrect values) eg. 0, 1, 2, 3 **or** one additional value, eg –1, 0, 1, 2, 3, 4)
	(b)		$-4 < x \leq 3$	2	B2 for $-4 < x \leq 3$ **or** > -4 **and** ≤ 3 (B1 for $-4 < x$ **or** $x > -4$ **or** $x \leq 3$ **or** $3 \geq x$ **or** > -4 **or** ≤ 3 **or** $-4 \leq x < 3$) NB : Accept the use of any letter
	(c)	$3y - 2 > 5$ $3y > 7$	$y > \frac{7}{3}$	2	M1 for clear intention to add 2 to both sides (of inequality or equation) or clear intention to divide all three terms by 3 **or** $3y > 7$ **or** $3y < 7$ **or** $3y = 7$ A1 $y > \frac{7}{3}$ **or** $y > 2\frac{1}{3}$ **or** $y > 2.\dot{3}$ NB. final answer **must** be an inequality (SC B1 for $\frac{7}{3}$ oe seen if M0 scored)
9	(a)		32	1	B1 cao
	(b)	LQ = 21 UQ = 45	24	2	M1 for 45 **or** 21 **or** 43.5 **or** 19.5 **or** 7.75^{th} **or** 8^{th} **or** 23.25^{th} **or** 24^{th} (all of above may be seen in working space or indicated on S&L) **or** clear attempt to find UQ and LQ from a list of values or in stem and leaf diagram A1 cao

1MA0_2H

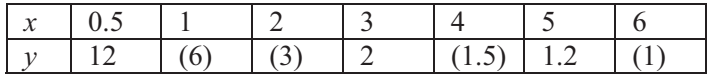
Question		Working	Answer	Mark	Notes
10		**For example** |	| **UK** | **USA** | | **$ per US gal** | ($)6.90(8412) | [$3.15] \| \| **£ per litre** \| [£1.24] \| (£)0.56(53...) \| \| **£ per US gal** \| (£)4.69(96) \| (£)2.14(28...) \| \| **$ per litre** | ($)1.82(28) \| ($)0.83(11...) | Cost in £ per US gal of UK fuel= £1.24 × 3.79 = £4.6996 Cost in $ per US gal of UK fuel = $1.47 × 4.6996 = $6.908412 **OR** Cost in £ of 1 US gal of US fuel = $3.15 ÷ 1.47 = £2.14 Cost in £ per litre of US fuel = £2.14 ÷ 3.79 =£0. 56(5.. **OR** Cost in UK in £ per US gal = £1.24 × 3.79 (=£4.6996) Cost in USA in £ per US gal = £3.15 ÷ 1.47 (=2.1428) **OR** Cost in UK is $ per litre = £1.24 × 1.47 (=1.8228) Cost in USA in $ per litre = 3.15 ÷ 3.79 (=0.8311...)	Cheaper in US	4	M1 for 1.24 × 3.79 (= 4.6996) **or** 1.24 × 1.47 (=1.8228) M1 for 1.47 × '4.6996' **or** 3.79 × '1.8228' A1 for 6.90(8412) C1 (dep on M2) for $'6.90(8412)' or $'6.91' and reaching a conclusion consistent with their calculation **OR** M1 for 3.15 ÷ 1.47 (=2.1428..) **or** 3.15 ÷ 3.79 (=0.8311) M1 for '2.14' ÷ 3.79 **or** '0.8311' ÷ 1.47 A1 for 0. 56(53…) C1 (dep on M2) for £'0. 56(53...)' or '£0.57' and reaching a conclusion consistent with their calculation **OR** M1 1.24 × 3.79 (= 4.6996) M1 3.15 ÷ 1.47 (=2.1428..) A1 4.69(96) and 2.14(28...) C1 (dep on M2) for £'4.69(96)' **or** £'4.70' **AND** £'2.14(28...)' and reaching a conclusion consistent with their calculation **OR** M1 for 1.24 × 1.47 (=1.8228) M1 for 3.15 ÷ 3.79 (=0.8311...) A1 for 1.82(28) **and** 0.83(11...) C1 (dep on M2) for $'1.82(28)' and $'0.83(11...)' and reaching a conclusion consistent with their calculation **NB:** Throughout values can be rounded or truncated to 1 or more decimal places. In order to award the communication mark, correct currency must be shown with the calculated value(s) but these can still be rounded or truncated to one or more decimal places as they are being used for comparison.

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		show	2	M1 for $x\times x\times x$ **or** $2\times 5\times x$ **or** vol of cube $= x^3$ **or** vol cuboid $= 10x$ A1 correct completion leading to $x^3 - 10x = 100$
	(b)	$x = 1$: -9 $x = 2$: -2 $x = 3$: -3 $x = 4$: 24 $x = 5$: 75 $x = 6$: 156 $x = 10$: 900 $x = 5.1$: 81.(651) $x = 5.2$: 88.(608) $x = 5.3$: 95.(877) $x = 5.4$: 103.(464) $x = 5.5$: 111.(375) $x = 5.6$: 119.(616) $x = 5.7$: 128.(193) $x = 5.8$: 137.(112) $x = 5.9$: 146.(379) $x = 5.35$: 99.6(30375) $x = 5.36$: 100.3(90656) $x = 5.355$: 100.0(101139)	5.4	4	B2 for a trial $5 \le x \le 6$ evaluated correctly (B1 for any **two** trials evaluated correctly for positive values of x) B1 for a different trial $5.3 < x < 5.4$ evaluated correctly B1 (dep on at least one previous B1) for 5.4 Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1 d.p., but correct to 1 d.p. (rounded or truncated) if the value of x is to 2 or more d.p. NB. Allow 100 for a trial of $x = 5.355$

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)		Correct Frequency Polygon	2	B2 Fully correct polygon. Points plotted at the midpoint (B1 All points plotted accurately not joined, **or** one error in plotting but joined **or** all points plotted accurately and joined with, additionally, first joined to last **or** all points at the correct heights and consistently within or at the ends of the intervals **and** joined (Includes joining last to first to make a polygon)) NB: ignore polygon before 1st point, and after last point. Ignore any histograms.
	(b)		$30 < t \leq 40$	1	B1 Allow any notation eg, 30-40 ft polygon
	(c)	$(6 + 2) = 8$, $(4 + 8 + 14 + 16 + 6 + 2) = 50$	$\frac{8}{50}$ oe	2	M1 $(6 + 2) \div (4 + 8 + 14 + 16 + 6 + 2)$ **or** ft figures from polygon **or** $\frac{8}{a}$ with $a > 8$ **or** $\frac{c}{50}$ with $c < 50$ **or** 8 and 50 used but notation incorrect (eg. 8:50 , 8 out of 50) A1 $\frac{8}{50}$ oe (eg. 0.16) **or** ft figures from polygon

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
13		Volume = $\frac{5\times12}{2}\times15$ Mass = $\frac{5\times12}{2}\times15\times6.6$	2970	3	M1 $\frac{5\times12}{2}\times15$ (=450) M1 (dep on 1st M1) '450'$\times 6.6$ A1 cao SC: If no marks awarded then award B1 for an answer of 5940
14	(a)		$x(x+7)$	1	B1 cao
	(b)		$(y-8)(y-2)$	2	M1 $(y \pm 8)(y \pm 2)$ **or** $y(y-2) - 8(y-2)$ **or** $y(y-8) - 2(y-8)$ A1 cao
	(c)(i)	$2t^2+5t+2 = (2t+1)(t+2)$	$(2t+1)(t+2)$	3	M1 $(2t+2)(t+1)$ oe **or** $2t(t+2)+1(t+2)$ **or** $t(2t+1)+2(2t+1)$ A1 $(2t+1)(t+2)$
	(ii)	This is always a product of two whole numbers each of which is greater than 1	Correct explanation		B1 ft from (i) for a convincing explanation referring to factors found in (i)
15		$9-3=6$ $10^2-6^2=64$ $BC=8$ $AC^2=9^2+8^2=145$	12.0	5	M2 $10^2-(9-3)^2$ (=64) **or** $BC=8$ (M1 $9-3$ (= 6) may be seen on diagram) M1 (indep) $9^2+'BC'^2$ where BC is a numerical value M1 (dep on previous M1) $\sqrt{81+'64'}$ A1 12.0 – 12.042

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
16		$\frac{64.8-59.3}{64.8}\times 100$ (=8.487...) **OR** $\frac{59.3}{64.8}\times 100 = 91.512$ 100 – '91.512' =8.487...)	8.49	3	M1 64.8 − 59.3 (=5.5) M1 (dep) $\frac{'5.5'}{64.8}\times 100$ oe A1 8.48 – 8.49 **OR** M1 $\frac{59.3}{64.8}\times 100$ oe (= 91.5(12...)) M1 (dep) 100 – '91.5' A1 8.48 – 8.49 **OR** M1 $\frac{59.3}{64.8}$ (=0.915(12...)) M1 (dep) 100 × (1 − '0.915') A1 8.48 − 8.49

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
17		$\sin 60^o = \frac{x}{32}$ $x = 32 \times \sin 60$ (=27.712...)	27.7	3	M1 $\sin 60 = \frac{x}{32}$ **or** $\frac{x}{\sin 60} = \frac{32}{\sin 90}$ oe M1 $(x =)\ 32 \times \sin 60$ **or** $(x =)\ \frac{32}{\sin 90} \times \sin 60$ A1 27.7 − 27.72 **OR** M1 $\cos(90 - 60) = \frac{x}{32}$ M1 $(x =)\ 32 \times \cos(90 - 60)$ A1 27.7 − 27.72 Radians : − 9.7539398... Gradians : 25.888554... SC : B2 for an answer in the range (−) 9.75 to (−)9.754 **or** 25.8 to 25.9
18	(a)		Correct table	2	B2 all 3 correct (B1 1 or 2 correct)
	(b)		Correct graph	2	M1 at least 6 points plotted correctly from their table A1 cao for correct curve drawn from (0.5, 12) to (6, 1)

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
19		16 metres: 8×10^8 km. 16: $8 \times 10^8 \times 1000$ 16: 8×10^{11} 1: 5×10^{10} **OR** 2 m to 10^8 km 2m to 100 000 000 000m 1m to 50 000 000 000m	1: 5×10^{10}	3	M1 (indep) correct method to convert to consistent units M1 $\frac{'8\times10^8'}{'16'}$ (units may not be consistent) **or** 5×10^{10} oe **or** 5×10^7 oe A1 1: 5×10^{10} **or** 1: 50 000 000 000 **OR** M1 (indep) correct method to convert to consistent units M1 $\frac{'16'}{8}$ to $'10^8'$ A1 1: 5×10^{10} **or** 1: 50 000 000 000
20		$\frac{3(x+1)}{6}+\frac{2(x+3)}{6}=\frac{3x+3+2x+6}{6}$	$\frac{5x+9}{6}$	3	M1 Use of common denominator of 6 (**or** any other multiple of 6) and at least one numerator correct Eg. $\frac{3(x+1)}{6}$ or $\frac{2(x+3)}{6}$ M1 $\frac{3(x+1)}{6}+\frac{2(x+3)}{6}$ oe A1 cao

<table>
<tr><th colspan="8">1MA0_2H</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th colspan="3">Notes</th></tr>
<tr><td>21</td><td>(a)</td><td>$\frac{2}{7}\times\frac{1}{6}$

OR

<table>
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<tr><td>1</td><td>X</td><td>√</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>√</td><td>X</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td>X</td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td>X</td></tr>
</table></td><td>$\frac{2}{42}$</td><td>2</td><td colspan="3">M1 $\frac{2}{7}\times\frac{1}{6}$
A1 $\frac{2}{42}$ oe

OR

M1 Fully correct sample space with the correct cases identified
A1 $\frac{2}{42}$ oe

SC : B1 for an answer of $\frac{4}{49}$</td></tr>
</table>

1MA0_2H

Question		Working	Answer	Mark	Notes
21	(b)	$\frac{2}{7}\times\frac{5}{6}+\frac{3}{7}\times\frac{2}{6}$ **OR** (table below)	$\frac{16}{42}$	3	M1 for identifying all 3 possibilities of (1,2) and (1,3) and (2,3) **OR** at least one of $\frac{2}{7}\times\frac{3}{6}$ (1, 2) **or** $\frac{2}{7}\times\frac{2}{6}$ (1, 3) **or** $\frac{3}{7}\times\frac{2}{6}$ (2, 3) **or** $\frac{2}{7}\times\frac{5}{6}$ (1, 2 or 3) M1 $\frac{2}{7}\times\frac{5}{6}+\frac{3}{7}\times\frac{2}{6}$ **or** $\frac{2}{7}\times\frac{3}{6}+\frac{2}{7}\times\frac{2}{6}+\frac{3}{7}\times\frac{2}{6}$ A1 $\frac{16}{42}$ oe **OR** M2 Fully correct sample space with the correct cases identified (M1 for 1,2 and 1,3 and 2,3 identified on a sample space) A1 $\frac{16}{42}$ oe SC: B2 for an answer of $\frac{16}{49}$

	1	**1**	**2**	**2**	**2**	**3**	**3**
1	X		√	√	√	√	√
1		X	√	√	√	√	√
2			X			√	√
2				X		√	√
2					X	√	√
3						X	
3							X

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
22	(a)	$x = \frac{-9 \pm \sqrt{9^2 - 4\times 2\times -7}}{2\times 2} = \frac{-9 \pm \sqrt{137}}{4}$	0.676, − 5.18	3	M1 $\frac{-9 \pm \sqrt{9^2 - 4\times 2\times -7}}{2\times 2}$ allow substitution of ±7 for c M1 $\frac{-9 \pm \sqrt{137}}{4}$ A1 answers in ranges 0.67 - 0.68 **and** − 5.17 to − 5.18 **OR** M1 $(x + \frac{9}{4})^2$ oe M1 for method leading to $\pm\sqrt{\frac{137}{16}} - \frac{9}{4}$ A1 answers in ranges 0.67 - 0.68 **and** − 5.17 to − 5.18
	(b)	Put $y = \frac{1}{x}$ and use part (a) Or $7y^2 - 9y - 2 = 0$ $y = \frac{--9 \pm \sqrt{(-9)^2 - 4\times 7\times (-2)}}{2\times 7}$ $\frac{9 \pm \sqrt{137}}{14}$	1.48, − 0.193	2	M1 $y = \frac{1}{x}$ **or** $x = \frac{1}{y}$ A1 (ft) answers in range 1.47 - 1.48 **and** − 0.19 to − 0.194 **OR** M1 fully correct method which leads to $7y^2 - 9y - 2 = 0$ **or** $-7y^2 + 9y + 2 = 0$ with correct method to solve (condone sign errors in substitution) A1 (ft) answers in range 1.47 - 1.48 **and** − 0.19 to − 0.194

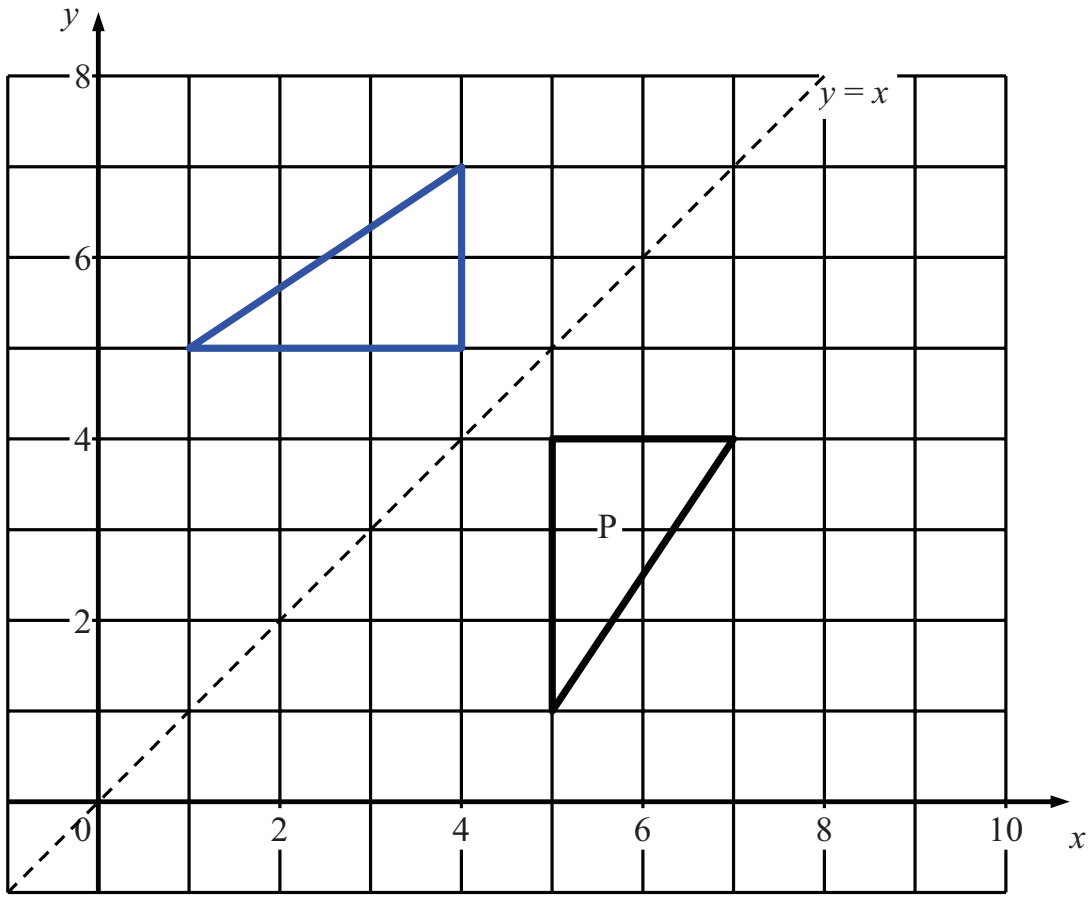
1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
23	(a)	Let O be the centre of the base. $OB^2 + OC^2 = 10^2$; $OB^2 = 50$ $AO^2 = AB^2 - OB^2 = 50$ Vol $= \frac{1}{3} \times 10^2 \times \sqrt{50}$ **OR** Let M be the midpt of side BC and let O be the centre of the base. $AM^2 + MC^2 = 10^2$; $AM^2 = 75$ $AO^2 = AM^2 - MO^2 = 50$ Vol $= \frac{1}{3} \times 10^2 \times \sqrt{50}$	236	4	M1 correct method to start to find BD or BO using triangle OBC or triangle BCD (oe) Eg. $OB^2 + OC^2 = 10^2$ **or** $BO^2 = 50$ **or** $BO = \sqrt{50}$ (=7.07..) **or** $BO = \frac{\sqrt{200}}{2}$ **or** $10^2 + 10^2 = BD^2$ **or** $BD^2 = 200$ **or** $BD = \sqrt{200}$ (=14.1..) M1 (dep) correct method to find height of pyramid using triangle AOB Eg. $AO^2 = 10^2 - '\sqrt{50}'^2$ **or** $AO^2 = 50$ **or** $AO = \sqrt{50}$ (=7.07..) M1 (indep) $\frac{1}{3} \times 10^2 \times '\sqrt{50}'$ (but **not** $\frac{1}{3} \times 10^2 \times 10$) A1 235 – 236 **OR** M1 correct method to start to find height of a face using triangle AMC (oe) Eg. $AM^2 + 5^2 = 10^2$ **or** $AM^2 = 75$ **or** $AM = \sqrt{75}$ (=8.66...) M1 (dep) correct method to find height of pyramid using triangle AOM Eg. $AO^2 = '\sqrt{75}'^2 - 5^2$ **or** $AO^2 = 50$ **or** $AO = \sqrt{50}$ (=7.07..) M1 (indep) $\frac{1}{3} \times 10^2 \times '\sqrt{50}'$ (but **not** $\frac{1}{3} \times 10^2 \times 10$) A1 235 – 236

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
23 cont.	(a)				**OR** M1 for $\sin 45 = \frac{x}{10}$ **or** $\cos 45 = \frac{x}{10}$ M1 for $h = 10 \times \sin 45$ **or** $h = 10 \times \cos 45$ (=7.07..) M1 (indep) $\frac{1}{3} \times 10^2 \times$ '7.07...' (but **not** $\frac{1}{3} \times 10^2 \times 10$) A1 235 – 236

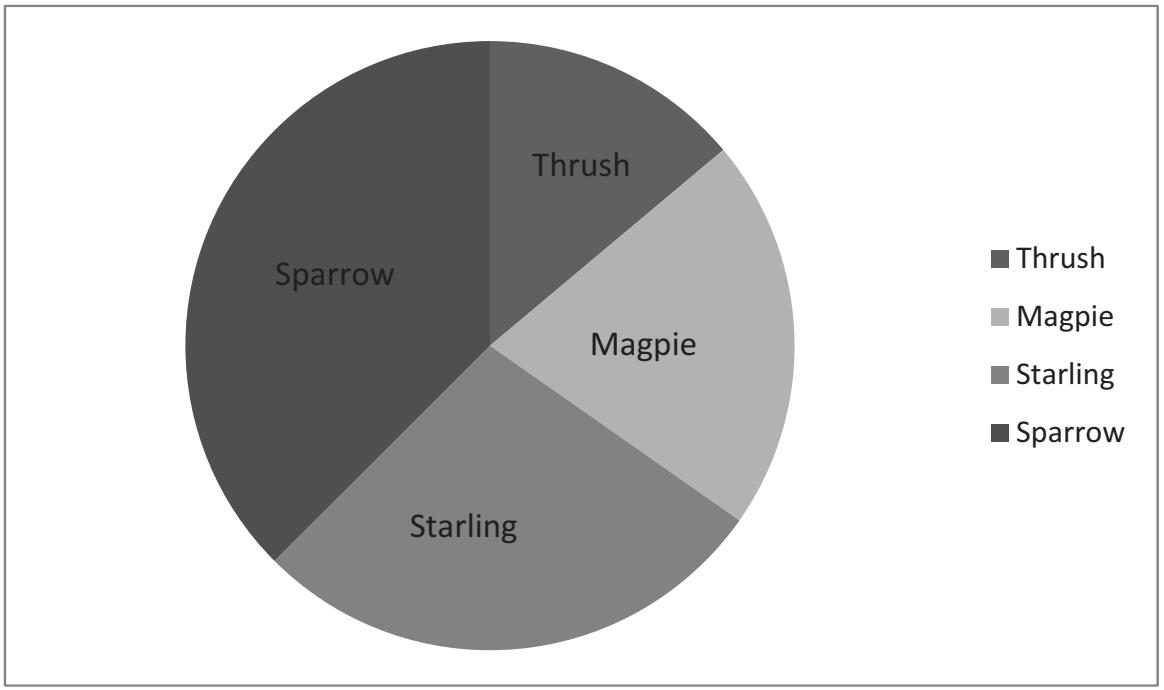
1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
23	(b)	Angle $ABO = 45^o$ Angle $DAB = 180 - 45 - 45$ **OR** In ΔBAD, $\cos A = \dfrac{10^2 + 10^2 - '\sqrt{200}'^2}{2 \times 10 \times 10} = 0$ **OR** In ΔBOA, $\cos B = \dfrac{'\sqrt{50}'}{10}$ Angle $BAD = 180 - $ '45' $-$ '45' **OR** $\sin A = \dfrac{'\sqrt{50}'}{10}$ $A = 45$ Angle $BAD = 2 \times$ '45'	90	2	M1 Angle $DAB = 180 - 2 \times$ '45' A1 89.98 - 90 **OR** M1 $\cos BAD = \dfrac{10^2 + 10^2 - '\sqrt{200}'^2}{2 \times 10 \times 10}$ A1 89.98 - 90 **OR** M1 $\sin A = \dfrac{'\sqrt{50}'}{10}$ A1 89.98 - 90

1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
24		<table><tr><th>Height h m</th><th>Freq</th><th>FD</th></tr><tr><td>$0 < h \leq 2$</td><td>7</td><td>3.5</td></tr><tr><td>$2 < h \leq 4$</td><td>14</td><td>7</td></tr><tr><td>$4 < h \leq 8$</td><td>18</td><td>4.5</td></tr><tr><td>$8 < h \leq 16$</td><td>24</td><td>3</td></tr><tr><td>$16 < h \leq 20$</td><td>10</td><td>2.5</td></tr></table>	3	3	B3 fully correct histogram with horizontal axis correctly scaled (B2 for 4 correct blocks **or** 5 correct blocks with incorrect or no scale) (B1 for 2 correct blocks of different widths **or** any 3 correct blocks) SC : B1 for key, eg. 1 cm^2 = 2 (trees) **or** correct values shown for (freq ÷ class interval) for at least 3 frequencies (3.5, 7, 4.5, 3, 2.5)
25		$A = \frac{1}{2} \times x \times 2x \times \sin 30^o$ $A = \frac{1}{2} \times 2x^2 \times 0.5$ **OR** Height = $2x \sin 30^o = x$ $A = \frac{x \times x}{2} = \frac{x^2}{2}$ **OR** Height = $x \sin 30 = \frac{x}{2}$ $A = \frac{1}{2} \times 2x \times \frac{x}{2} = \frac{x^2}{2}$	$x = \sqrt{2A}$ shown	3	M1 $(A =) \frac{1}{2} \times x \times 2x \times \sin 30^o$ A1 $A = x^2 \times 0.5$ **or** $A = \frac{x^2}{2}$ C1 for completion with all steps shown **OR** M1 height = $2x \sin 30$ (= x) A1 $A = x^2 \times 0.5$ **or** $A = \frac{x^2}{2}$ C1 for completion with all steps shown **OR** M1 for height = $x \sin 30$ (= $\frac{x}{2}$) A1 $A = x^2 \times 0.5$ **or** $A = \frac{x^2}{2}$ C1 for completion with all steps shown

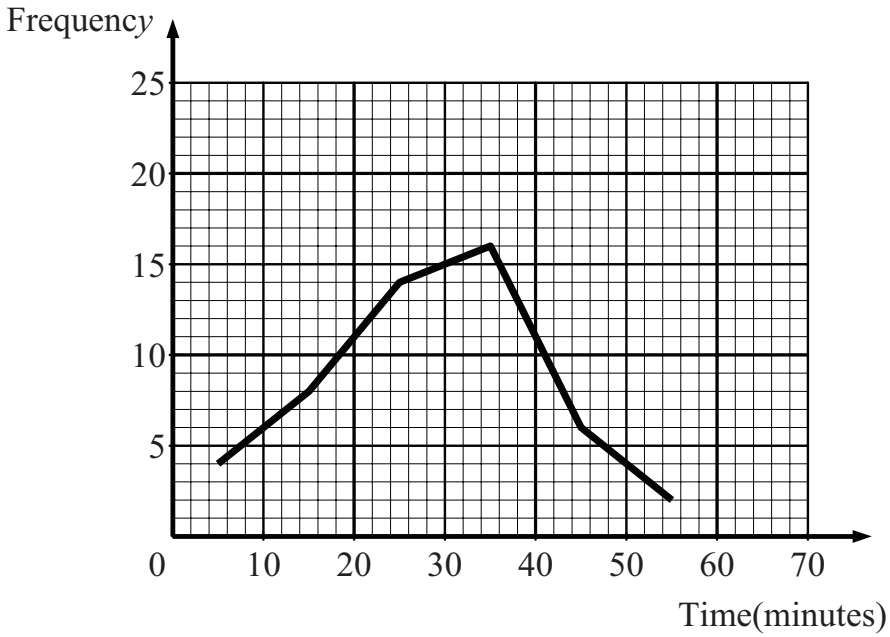
2.



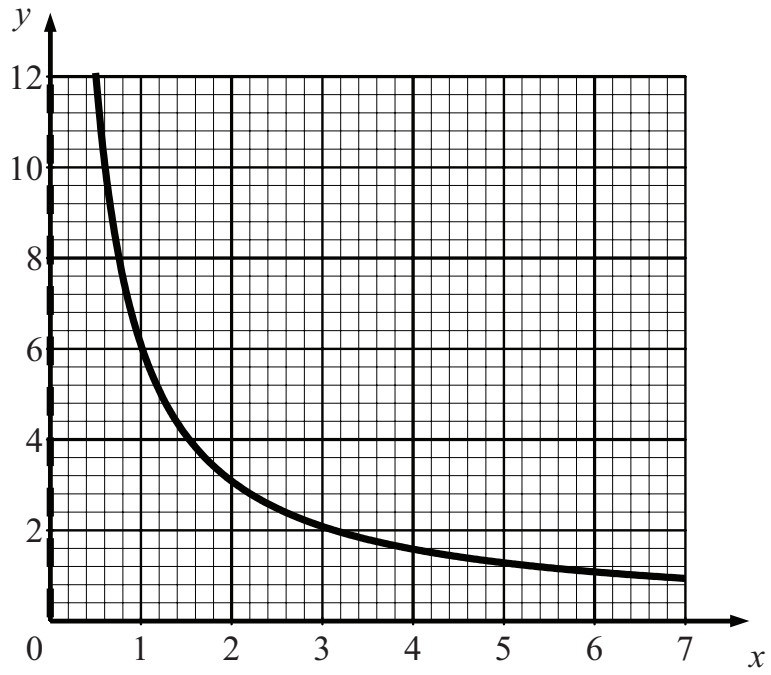
4.


Thrush
Sparrow
Magpie
Starling
Thrush
Magpie
Starling
Sparrow

12.


Frequency
25
20
15
10
5
0
10
20
30
40
50
60
70
Time(minutes)

18.



24.