

REVISE

.wales

F1.07 – Percentages & fractions of quantities

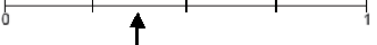
Mark schemes for the F1.07 question pack

Spec 1.4.6, 1.4.7, 1.4.8, 1.4.9 – Unit 1

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 82 questions in the corresponding revise.wales question pack (193 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

7.	18	B2	B1 for either 24 or -6. B0 for 24x or -6y.
8.	Intention to halve 9 minutes 18 seconds OR double 4 minutes 48 seconds NO, with sight of 4 minutes 39 seconds OR 9 minutes 36 seconds, or 279 (seconds) AND 288 (seconds) or 558 (seconds) AND 576 (seconds)	M1 A1	Accept equivalent statements e.g. Eira is wrong Allow incorrect notation for time e.g. 4.39, 9.36 (use of decimal points) <u>Alternative method 1</u> Correctly finding the difference between the two times as 4 minutes 30 seconds OR 270 seconds M1 NO, with comparison e.g. 4 minutes 30 seconds is less than 4 minutes 48 seconds OR 288 seconds is more than 270 seconds A1 <u>Alternative Method 2</u> Converting both times to seconds, before dividing one quantity by the other M1 NO, with sight of 2(.06...) OR 0.4(84375...) A1 If no marks, award SC1 for attempting to find the difference between the two times and comparing this with 4 minutes 48 seconds.

11.(a) 3	B1	• use appropriate terminology, units, etc.
11.(b) unlikely	B1	
11.(c) 	B1	Any indication of $\frac{1}{4}$ to $\frac{1}{2}$ exclusive.

Unit 1: Foundation Tier Summer 2018		
1.(a) 11.5 (cm)	B1	Accept 11.3 - 11.7 (cm)
1.(b) circle with radius 6 cm	B1	
1.(c) 134 (°)	B1	Accept 132 – 136 (°)

10.(a) $\frac{4}{5} \times 134$ or equivalent $= 107.2$ or $107\frac{1}{5}$ ISW	M1 A1	M1 for $134 \div (134 \div 5)$ M1 A0 for $536 \div 5$
10.(b) $0.3(0) \times 275$ or equivalent $= 82.5$ ISW	M1 A1	Award M1 for an uncorrected answer of 82 or 82.5

12.(a)		48°	B1	
12.(b)	East		B1	
12.(c)		200°	B1	

16.	50	B3	<p>Award B1 for each of the 2nd, 3rd and 4th condition <u>1-20 gain B1 apart from.</u> B0 for 4,12,16,20. B2 for 2,18.</p> <p><u>21-79 gain B2 apart from.</u> B1 for 24,28,36,40,44,48,52,56,60,64,68,76. B3 for 50.</p> <p><u>80-100 gain B1 apart from.</u> B0 for 80,84,88,92,96,100. B2 for 98.</p> <p><u>Otherwise</u> B0 if number greater than 100. B0 if not a whole number.</p>
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5.(a) Lines Curve	L1 C1	For all 3 straight lines. F.T. their lines, must have opposite curvature, starting at the correct place and ending at the start of their line.
5.(b) Rectangle	B1	
5.(c) Cylinder	B1	

<p>8.(a) (1 mile =) $\frac{8}{5}$(km) or 1600(m) or equivalent</p> <p>(Difference =) $\frac{8}{5} \times 1000 - 1.5 \times 1000$</p> <p style="text-align: right;">100 (metres)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>For sight of a correct conversion e.g. 5 miles = 8km , 1 km = $\frac{5}{8}$ mile. Allow more accurate correct approximations (for <u>all</u> marks) only if in the range [1609(m) to 1610(m)]</p> <p>No FT from an incorrect conversion. Allow M1 for $\frac{8}{5} - 1.5 (= 0.1)$ or equivalent.</p> <p>Allow -100 (metres). If no marks gained then allow SC1 for sight of $(1.5 \times \frac{5}{8})$</p>
<p>8.(b) 4×100^2</p> <p style="text-align: right;">= 40000</p>	<p>M1</p> <p>A1</p>	<p>Also for alternative correct methods e.g. (A 4x1 rectangle followed by) a 400×100 calculation, 200×200, etc.</p>

10. (£) 0.15×600 oe OR $320 \div 4$ OR 80	M1	Accept $15/100 \times 600$ but not $15\% \times 600$ unless correctly evaluated
(Larger amount is £) 90 AND sight of (£)80	A2	A1 for sight of (£)90. Accept '15% of £600' on answer line, provided (£)90 seen.

5(a) 481·63	B1	Do not accept 481·630
5(b) 64	B1	
5(c) 7	B1	Do not accept 7×7 or $7 \times 7 = 49$ alone.
5(d) (0)·03825	B1	
Ribbon mark 6(a),(b),(c),(d) 6(a) Football	B1	
Ribbon mark 6(a),(b),(c),(d) 6(b) $\frac{1}{4}$ or equivalent ISW	B1	Do not accept incorrect notation; e.g. 1 in 4, 1 out of 4, 1:4.
Ribbon mark 6(a),(b),(c),(d) 6(c) $\frac{1}{4} \times 60$ 15	M1 A1	Accept 15 out of 60. Award SC1 only, for a final answer of 15/60
Ribbon mark 6(a),(b),(c),(d) 6(d) Correctly labelled axes. Uniform scale starting from zero. Correct equal width bars for football, swimming and tennis.	B1 B1 B1	Vertical axis labelled 'number (of people)' or ' <i>people</i> ' or 'frequency' AND horizontal axis marked with the sports. Correct heights for 'their scale' (30 and 15) FT their (c) if possible: 'their swimming' = 'their tennis' AND either 'their football' = 2 x 'their tennis' or 'their football' = 60 – 2 x 'their tennis'. If no scale visible, allow final B1 for bars drawn in correct proportions.
7.(Number across = $20 \div 4 =$ 5 OR (Number down = $6 \div 2 =$ 3 (Total number of small rectangles =) 5×3 15	B1 M1 A1	Sight of 5 or 3, not in incorrect statement or working FT 'their stated across and down' CAO
<u>7. Alternative method</u> (Area rectangle A= $2 \times 4 =$) 8 (cm^2) OR (Area rectangle B= $6 \times 20 =$) 120 (cm^2) (No. of rectangle A=) $120 \div 8$ 15	B1 M1 A1	Sight of 8 or 120, not in incorrect statement or working FT 'their stated areas' CAO
Organisation and Communication	OC1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means

WJEC GCSE MATHEMATICS (NEW)

SUMMER 2019 MARK SCHEME

GCSE MATHEMATICS Unit 2: Foundation Tier	Mark	Comments
1. (£)5.84 (£)1.45 (£)4.67 (£)7.08	B1 B1 B1 B1	
2.(a) Pentagon	B1	
2.(b) Rhombus	B1	Allow equilateral kite, but not kite or parallelogram.
2.(c) Cylinder	B1	Allow circular prism.
3.(a) (47,) 94, 141	B1	Ignore additional multiples.
3.(b) 52	B1	
3.(c) 209	B1	
4.(a) Midpoint unambiguously indicated	B1	Allow +/- 2 mm.
4.(b) Unambiguous parallel line drawn through C	B1	Allow +/- 2°.
5.(a) 9 (and) 16	B2	Allow 3 ² (and) 4 ² . B1 for a sum of two square numbers less than 30 seen in workings or two square numbers less than 30 written on the answer line.
5.(b) Accept suitable explanations, e.g. <ul style="list-style-type: none"> the sum of three even numbers will be even (and 23 is odd) when you add any amount of even numbers the answer is always even (whilst 23 is odd). (23 is odd, but) even + even + even = even 	E1	Allow • even + even = even, • because 23 is odd.
6. FALSE TRUE FALSE TRUE	B2	For all four correct. B1 for 3 correct.
7.(a) 60 (%)	B2	B1 for equivalent fraction or decimal (0.6, 3/5, 12/20). If B2 not awarded, F.T. their fraction (except for 1/2, 1/4 and 3/4) correctly converted to a percentage for B1.
7.(b) Multiply by 4	E1	Accept other correct explanations e.g. divide (the number) by 5 then multiply by 20, double (the number) and double (it) again or divide by 1/4.
7.(c) Accept suitable explanations, e.g. <ul style="list-style-type: none"> 0.125 (is greater than) 0.1 5/40 (is greater than) 4/40 	E1	Award E1 for other correct explanations e.g. a larger denominator means each part of the whole is smaller, or for correct evaluation of 1/8 and 1/10 of a chosen number.
8.(a) 65 (°)	B1	Allow ±2°
8.(b) 225°	B1	
8.(c) (Small angle = 180 ÷ 6 =) 30(°) (Large angle = 5 × Small angle =) 150 (°)	B1 B1	Check diagram, though answer space takes precedence. F.T. 'their small angle' × 5 or 180 - 'their small angle', provided answer is less than 180°. If no marks awarded, award B1 for both correct angles given in reverse.

8.(c)	4000 mm ³	B1	
9.(a)	$\frac{60}{300} \times 100$ or equivalent 20(%)	M1 A1	Allow sight of 20/100, 0.2 for M1. M0 for 60/300 alone.
9.(b)	0.4 × 360 or equivalent e.g. $\frac{360}{100} \times 40$ 144(%)	M1 A1	

11.(a)	$1 - (0.2 + 0.3 + 0.25 + 0.15)$ or equivalent $= 0.1$ or equivalent.	M1 A1	<ul style="list-style-type: none"> • use appropriate terminology, units, etc
11.(b)	0.3×200 or equivalent.	M1 A1	

<p><u>Alternative method 1</u> Sight of 6.25 (hrs) OR 375 (min) (Remaining work takes) $\frac{3}{5}$ of time $= \frac{3}{5} \times 6.25$ OR $\frac{3}{5} \times 375$ $= 3.75$ (hrs) OR 225 (min) $= 3$ hours 45 minutes</p>	<p>B1 B1 M1 A1 B1</p>	<p>F.T. 'their time' in hours or in minutes. F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty. Allow unambiguous indication of units.</p>
<p><u>Alternative method 2</u> (Planning =) $\frac{2}{5} \times 6$ AND $\frac{2}{5} \times 15$ $= 2.4$(hrs) AND 6(min) $= 2$hrs 30min (Remainder of work =) 6(hr) 15(min) - 2(hrs) 30(min) $= 3$ hours 45 minutes</p>	<p>M1 A1 A1 M1 A1</p>	<p>2.4 hrs may be given as 2hrs 24min. C.A.O. F.T. 'their derived planning time' in hours and min.</p>
<p><u>Alternative method 3</u> (Remaining work takes) $\frac{3}{5}$ of time $= \frac{3}{5} \times 6$ AND $\frac{3}{5} \times 15$ $= 3.6$(hrs) AND 9(min) $= 3$hrs 36min + 9(min) $= 3$ hours 45 minutes</p>	<p>B1 M1 A1 M1 A1</p>	<p>3.6 hrs may be given as 3hrs 36min. F.T. 'their derived times' in hours and min.</p>
<p>16.(a) Attempt at $323 + 217$ AND $122 + 58$ $= 3 : 1$</p>	<p>B1 B2</p>	<p>Allow for an attempt at adding the correct two pairs of numbers. B1(plus previous B1) for a ratio equivalent to 3 : 1 e.g. 540 : 180. Allow B1B1 for a final answer of 1 : 3. If no marks gained allow SC1 for a final answer of 89 : 55 OR 55 : 89 (Llandudno : Aberystwyth ratio.)</p>
<p>16.(b) $\frac{445}{720}$ ISW $\left(\frac{89}{144}\right)$</p>	<p>B2</p>	<p>0.618(...) or 0.62 or 61.8(...) or 62% implies B2. B1 for $x/720$ if $x < 720$. B1 for $445/y$ if $y > 445$. Allow B1 for 0.61 or 61%. Penalise -1 for incorrect notation, e.g. 445 out of 720.</p>
<p>17.(a) $12x + 8 = 12$ OR $3x + 2 = 3$ $12x = 4$ OR $3x = 1$ $x = \frac{4}{12}$ OR $x = \frac{1}{3}$</p>	<p>B1 B1 B1</p>	<p>F.T. until 2nd error. Adding 'unlike terms' eg $12x + 8 = 20x$ or $3x + 2 = 5x$ to be taken as two errors. Mark final answer. Allow 0.33(33...) A final answer of 0.3 is (B1B1)B0.</p>
<p>17.(b) $3x + 10x$ $13x$ (pence)</p>	<p>B2 B1</p>	<p>B1 for $3x + 5 \times 2x$ OR for sight of $10x$ Mark final answer.</p>
<p>18. $a = 123^\circ$ $b = 57^\circ$ $c = 74^\circ$</p>	<p>B1 B1 B1</p>	<p>OR F.T. $180 - a$.</p>

17.	0	1	1
18.	$\frac{24 \times AC}{2} = 84 \text{ or equivalent.}$ $AC = 7 \text{ (cm)}$ $(BC^2 =) 7^2 + 24^2$ $BC^2 = 625 \text{ or } (BC =) \sqrt{625}$ $(BC =) 25(\text{cm})$ $(\text{Perimeter} = 24 + 7 + 25 =) 56(\text{cm})$	M1 A1 M1 A1 A1 B1	F.T. 'their AC'. Final answer of BC = 625 is M1A0A0. F.T. $\sqrt{\text{'their 625'}}$ provided M1 gained. F.T. 24 + 'their AC' + 'their BC' provided at least one M1 mark gained AND 'their BC' > 24. <u>Alternative method to find BC</u> A correct and <u>complete</u> method (e.g. using two trigonometric relationships.) M2 BC = 25(cm) A1

<p>19.</p> <p>(Area of ABCF =) $91 = 7 \times CF$ $(CF = 91/7 =) 13 \text{ (cm)}$</p> <p>(Area CDEF =) $\frac{(13 + 8) \times 6}{2}$</p> <p>$= 63 \text{ (cm}^2\text{)}$</p>	<p>M1 A1</p> <p>M1 A1</p>	<p><i>Lengths may be shown on the diagram.</i></p> <p>Allow AB shown as 13 (cm) for M1 A1. Allow an embedded 13 e.g. $7 \times 13 = 91$ for M1 A1. If '13' <u>seen</u> to come from '6 + 7' then M0 A0.</p> <p>FT 'their stated or shown length CF'. Must be equal to AB if only AB calculated. Allow M1 for correct intent <u>seen</u>. e.g. $13 + 8 \times 6 \div 2$ (M0 if only unsupported answer of 37 given.)</p>
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WJEC GCSE MATHEMATICS
AUTUMN 2020 MARK SCHEME

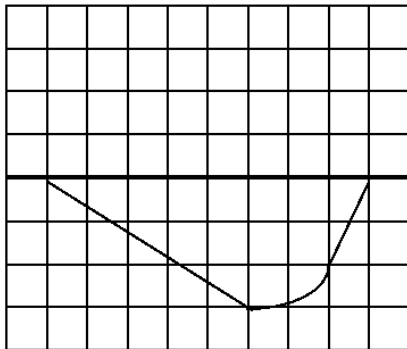
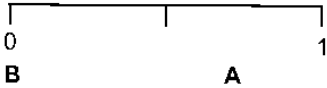
GCSE Mathematics Unit 1: Foundation Tier	Mark	Comments
1. (a) Angle of 35° drawn at A	B1	Accept 33° to 37° Point alone is not sufficient.
1.(b) Circle radius 7cm (diameter 14 cm)	B1	Accept radius 6.8 (cm) to 7.2 (cm)
2.(a) 5433	B1	
2.(b) 174	B1	
2.(c) 75	B1	
2.(d) $6 \times 7 \div 2$ = 21	M1 A1	If no marks, award SC1 for sight of 42.
3.(a) 600	B1	
3.(b) 4000	B1	
4.(a) D	B1	
4.(b) S	B1	
5.(a) 9	B1	
5.(b) ÷ –	B1	
6.(a) 53	B1	
6.(b) 125	B1	
7.(a) 70 (%)	B1	
7.(b) 6 sectors shaded	B1	
8. $\frac{1}{3} \times 180(^{\circ})$ OR $\frac{2}{3} \times 180(^{\circ})$ or equivalent 60(°) OR 120(°) (180 – 60 =) 120 (°) OR (180 – 120 =) 60 (°)	M1 A1 B1	A1 for either 60(°) OR 120(°) FT 'their 60' or 'their 120'. Two angles which add to 180(°) will get this B1. If no marks award SC1 for one angle twice the size of the other.
<u>Alternative Method</u> $2x + x = 180 (^{\circ})$ or $3x = 180 (^{\circ})$ $x = 60 (^{\circ})$ $2x = 120 (^{\circ})$	M1 A1 B1	FT $2 \times$ 'their x' or $180 -$ 'their x'
9.(a) 16g	B1	
9.(b) (y =) 9	B1	Accept embedded answers. Mark final answer.
9.(c) (w =) 30	B1	Accept embedded answers. Mark final answer.

WJEC GCSE MATHEMATICS
AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 1: Foundation Tier	Mark	Comments
1. (a) Angle of 35° drawn at A	B1	Accept 33° to 37° Point alone is not sufficient.
1.(b) Circle radius 7cm (diameter 14 cm)	B1	Accept radius 6.8 (cm) to 7.2 (cm)
2.(a) 5433	B1	
2.(b) 174	B1	
2.(c) 75	B1	
2.(d) $6 \times 7 \div 2$ = 21	M1 A1	If no marks, award SC1 for sight of 42.
3.(a) 600	B1	
3.(b) 4000	B1	
4.(a) D	B1	
4.(b) S	B1	
5.(a) 9	B1	
5.(b) ÷ –	B1	
6.(a) 53	B1	
6.(b) 125	B1	
7.(a) 70 (%)	B1	
7.(b) 6 sectors shaded	B1	
8. $\frac{1}{3} \times 180(^{\circ})$ OR $\frac{2}{3} \times 180(^{\circ})$ or equivalent 60(°) OR 120(°) (180 – 60 =) 120 (°) OR (180 – 120 =) 60 (°)	M1 A1 B1	A1 for either 60(°) OR 120(°) FT 'their 60' or 'their 120'. Two angles which add to 180(°) will get this B1. If no marks award SC1 for one angle twice the size of the other.
<u>Alternative Method</u> $2x + x = 180 (^{\circ})$ or $3x = 180 (^{\circ})$ $x = 60 (^{\circ})$ $2x = 120 (^{\circ})$	M1 A1 B1	FT 2 × 'their x' or 180 – 'their x'
9.(a) 16g	B1	
9.(b) (y =) 9	B1	Accept embedded answers. Mark final answer.
9.(c) (w =) 30	B1	Accept embedded answers. Mark final answer.

<p>16. 2.656×10^6</p>	<p>B2</p>	<p>B1 for a correct value but not in standard form. Mark final answer. B1 for sight of 2 656 000. SC1 for 2.66×10^6 or 2.7×10^6 or 2.6×10^6 or 2.65×10^6</p>
<p>17. Sight of 24.5 AND 15.5 OR Sight of 23.5 AND 14.5</p> <p>$2(24.5 + 15.5) - 2(23.5 + 14.5)$ or equivalent</p> <p style="text-align: right;">$= 4(\text{cm})$</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Sight of (Greatest =) 80 <u>OR</u> (Least =) 76 implies B1</p> <p>FT only for upper bounds of 24.4 AND 15.4 or 24.49 AND 15.49 (lower bounds must be 23.5 AND 14.5 else M0)</p> <p>CAO If M0, award B1 and an SC1 for sight of (Greatest =) 80 <u>AND</u> (Least =) 76</p>
<p><u>Alternative method.</u></p> <p><i>Difference between least and greatest length for each side = 1(cm)</i></p> <p style="text-align: center;">4×1</p> <p style="text-align: right;">$= 4(\text{cm})$</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>FT only for differences of 0.9 or 0.99</p> <p>CAO</p>
<p>18.</p> <p>Method to eliminate variable e.g. equal coefficients with <u>appropriate</u> addition or subtraction. First variable found, $x = 4$ or $y = -1$. Substitute to find the 2nd variable. Second variable found</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p>No marks for trial and improvement. Allow 1 error in one term, not the term with equal coefficients.</p> <p>C.A.O. F.T. their '1st variable'. Award no marks for unsupported correct answers.</p>
<p>19.(a)(i) Correct reason given. e.g. 'An angle at the circumference subtended by a diameter is a right angle'. 'line AC is a diameter'</p>	<p>E1</p>	<p>Accept any correct unambiguous wording. The key word is '<u>diameter</u>'. Allow eg 'angle in a semicircle is 90°', 'line AC goes through the centre'. 'opposite a diameter' Do not accept 'because it's a right angle'.</p>
<p>19.(a)(ii) $\tan x = \frac{7.5}{4.7}$</p> <p>$x = \tan^{-1}(7.5 / 4.7)$ or $\tan^{-1} 1.6$ or $\tan^{-1} 1.59(\dots)$</p> <p style="text-align: right;">$= 57.9(\dots)^\circ$ or $57.8(\dots)^\circ$ or 58°</p>	<p>M1</p> <p>m1</p> <p>A1</p>	<p>Implies M1.</p> <p>C.A.O. <u>Alternative method to find x</u> A correct and complete method (using Pythagoras's theorem and a trigonometric relationship). M2 $x = 57.9(\dots)^\circ$ or $57.8(\dots)^\circ$ or 58° CAO A1</p>
<p>19.(b) $(y =) 58^\circ$</p> <p>Correct circle theorem given. e.g. 'angles (at the circumference) subtended by the same chord (or arc) are equal', 'angles in the same segment (are equal)'.</p>	<p>B1</p> <p>E1</p>	<p><u>Strict</u> FT of 'their x'.</p> <p>Accept any correct unambiguous wording. Allow eg 'angles on the same chord (are equal)' Do not accept e.g. 'they are equal' on its own.</p>

WJEC GCSE MATHEMATICS
AUTUMN 2021 MARK SCHEME

Unit 1: Foundation Tier	Mark	Comments
1.(a) Ninety-five thousand and forty-eight	B1	
1.(b) 931	B1	
1.(c) 1250	B1	
1.(d) 208	B1	
1.(e) 1,2,3,6,9,18	B2	B1 for 4 or 5 correct and 0 incorrect B1 for 5 or 6 correct and 1 incorrect Ignore repeated numbers Accept products 1×18 , 2×9 , 3×6
2.(a) 94 (mm)	B1	Accept 92 to 96 (mm)
2.(b) 136°	B1	Accept 134 to 138°
3.(a) 16	B1	
3.(b) $\frac{3}{4}$	B1	Mark final answer.
3.(c) 28	B1	
4. 	B2	B1 for correct longer straight line. B1 for correct curve AND shorter straight line. The lines must pass through the correct points.
5.(a) 4.3×1000 4300 (g)	M1 A1	
5.(b) $3 \times 100 \div 6$ 50 (cm)	M1 A1	If M0 A0, award SC1 for sight of 300(cm) or 0.5(m).
6. 	B1 B1	A should be between 0.6 and 0.8 B should be at 0

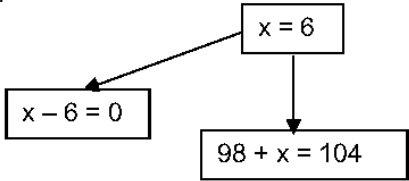
WJEC GCSE MATHEMATICS
AUTUMN 2021 MARK SCHEME

Unit 1: Intermediate Tier	Mark	Comments
1.(a) $(x =) 180 - 90 - 37$ or equivalent. $= 53(^{\circ})$	M1 A1	
1.(b) $(a =) 51(^{\circ})$ $(b =) 360 - (51 + 82 + 153)$ or equivalent. $= 74(^{\circ})$	B1 M1 A1	FT 'their 51', i.e. $125 -$ 'their 51' provided 'their 51' < 125.
2.(a) $\frac{1}{9}$	B1	
2.(b) 0.016	B1	
2.(c) 0.015	B1	
3.(a) $\frac{1}{10}$ or 0.1	B1	Mark final answer.
3.(b) Sight of 27 AND 4 $(27 \div 4 =) 6.75$	B1 B1	FT if at least 27 or 4 correct and of equivalent difficulty (i.e. <u>not</u> leading to a whole number answer). Answer must be a decimal
4.(a) (Volume =) $5 \times 3 \times 2$ $= 30 \text{ (cm}^3\text{)}$	M1 A1	Any additional calculation e.g. $30 \div 2 = 15$ is M0.
4.(b) Sight of $5 \times 3 (=15)$ AND $5 \times 2 (=10)$ AND $3 \times 2 (=6)$ (Total Surface Area =) $(5 \times 3 + 5 \times 2 + 3 \times 2) \times 2$ $62 \text{ (cm}^2\text{)}$	B1 M1 A1	For <u>addition</u> of all six surface areas. (Must be three different pairs.) FT 'their 15', 'their 10' and 'their 6' C.A.O.
5. Sight of 9 AND 49 $n + 9 = 49$ $(n =) 40$	B1 M1 A1	Any unambiguous indication that this linear relationship is being considered (including 'trial and improvement'). FT their $\sqrt{81}$ ($\neq 81$) AND their 7^2 ($\neq 7$) for M1 and possibly A1 if at least one correct value used. FT for M1 <u>only</u> if neither correct value used. Award M1 if $49 - 9$ seen. Mark final answer.
6. Indicates 2 (letters out of 6 gain points) (Expected number of wins =) $\frac{2}{6} \times 24$ or equivalent $= 8$ (Points gained =) 8×10 $= 80$ (points) AND 'No' (Leah is not expected score 100 points)	B1 M1 A1 M1 A1	Any unambiguous indication. FT 'their stated number of '10 point' letters'. Award M1A1 for $8/24$ suggesting '8 wins out of 24' FT 'their derived 8×10 <u>only</u> if 'their derived 8' < 24. FT their <u>derived</u> number of points
<u>Alternative method 1</u> Indicates 2 (letters out of 6 gain points) (Each letter expected to be drawn) $\frac{24}{6}$ (times) $= 4$ (times) (Points gained =) $4 \times 2 \times 10$ $= 80$ (points) AND 'No' (Leah is not expected score 100 points)	B1 M1 A1 M1 A1	Any unambiguous indication. FT 'their derived 4' and 'their stated 2'. FT their <u>derived</u> number of points.

WJEC GCSE MATHEMATICS
AUTUMN 2021 MARK SCHEME

Unit 2: Foundation Tier	Mark	Comments																
1.(a) 5169	B1																	
1.(b) 6502	B1																	
1.(c) 186	B1																	
1.(d) 45	B1																	
2.(a) 5, 5, 5, 5	B1																	
2.(b) Exactly two 3s and any other two numbers	B1	Accept in any order.																
2.(c) Exactly one 2 and any other three numbers	B1	Accept in any order.																
3.(a) 40 065	B1																	
3.(b) 5400	B1																	
4.(a) rhombus	B1																	
4.(b) equilateral triangle	B1																	
5. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">71</td> <td style="text-align: center;">60</td> <td style="text-align: center;">78</td> <td style="text-align: center;">41</td> </tr> <tr> <td style="text-align: center;">26</td> <td style="text-align: center;">85</td> <td style="text-align: center;">27</td> <td style="text-align: center;">112</td> </tr> <tr> <td style="text-align: center;">95</td> <td style="text-align: center;">105</td> <td style="text-align: center;">42</td> <td style="text-align: center;">8</td> </tr> <tr> <td style="text-align: center;">58</td> <td style="text-align: center;">0</td> <td style="text-align: center;">103</td> <td style="text-align: center;">89</td> </tr> </table>	71	60	78	41	26	85	27	112	95	105	42	8	58	0	103	89	B3	B2 for 3 rows or 3 columns with a total of 250. B1 for 1 or 2 rows or 1 or 2 columns with a total of 250.
71	60	78	41															
26	85	27	112															
95	105	42	8															
58	0	103	89															
6.(a) 98	B1																	
6.(b) Subtract 13 (from the previous term)	B1	Accept -13, goes down in 13s, etc.																
6.(c) x-2 (years old)	B1	Mark final answer.																
7.(a) Sum of numbers (262) Sum of numbers \div 4 65.5 or equivalent	M1 m1 A1	Allow for an unsupported value between 173 and 351. Award this m1 for 'their sum' \div 4 CAO. Allow 131/2. If no marks awarded, allow SC1 for (64 + 89 + 83 + 26 \div 4 =) 242.5 or equivalent.																
7.(b) (65.5 + 1 =) 66.5	B1	F.T. 'their mean' from (a). Allow 133/2.																
8.(a) 23.04	B1	Accept $23 \frac{1}{25}$ or equivalent e.g. 576/25																
8.(b) 7.9	B1	Accept $7 \frac{9}{10}$ or equivalent e.g. 79/10																
8.(c) 0.04×325 or equivalent = 13 ISW	M1 A1																	
9. (Oliver's number is) 90	B3	B2 for a final answer <u>between 40 and 95</u> satisfying 2 of the 3 conditions. (45, 54, 60, 72) B1 for a final answer <u>between 40 and 95</u> satisfying only 1 of the 3 conditions. (40, 42, 44, 46, 48, 50, 52, 56, 58, 62, 63, 64, 66, 68, 70, 74, 75, 76, 78, 80, 81, 82, 84, 86, 88, 92, 94)																
OC Organisation and Communication.	OC1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> present their response in a structured way explain to the reader what they are doing at each step of their response lay out their explanation and working in a way that is clear and logical write a conclusion that draws together their results and explains what their answer means 																

<p><u>Alternative method 2</u> . Indicates 2 (letters out of 6 gain points) (Expected number of wins =) $\frac{2}{6} \times 24$ or equivalent $= 8$ (Number of wins required =) $\frac{100}{10}$ $= 10$ (wins) AND 'No' (Leah is not expected score 100 points)</p>	<p>B1 M1 A1 M1 A1</p>	<p>Any unambiguous indication. FT 'their stated number of '10 point' letters'. Award M1A1 for 8/24 suggesting '8 wins out of 24' FT their <u>derived</u> number of <u>expected</u> wins. <u>Note for Alternative method 2</u> If 'number of wins required' is calculated before calculating 'number of expected wins' then the conclusion ('AND') will be attached to the 8 rather than the 10.</p>
<p>OCW Organisation and Communication. Accuracy of writing.</p>	<p>OC1 W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • <u>write a conclusion that draws together their results and explains what their answer means</u> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc
<p>7. $4x + 5 = 57$ or equivalent $4x = 52$ $x = 13$</p>	<p>M1 A1 A1</p>	<p>FT from $4x = k$. Accept $x = k/4$ (but, if on FT k is a multiple of 4, final answer must be given as a whole number.) M1A1A0 for '$x = 52/4$' Mark final answer. Allow (M1)A1A1 for a correct embedded answer BUT only (M1)A1A0 if contradicted by $x \neq 13$.</p>
<p>8. 3, 4, 4, 9 OR 3, 3, 5, 9.</p>	<p>B3</p>	<p>B1 for a range = 6. B1 for a total = 20. B1 for a median = 4. Penalise use of negative or non-integer values -1. FOUR numbers must be shown, otherwise B0.</p>
<p>9.(a) $\frac{54}{300} \times 100$ or equivalent $= 18(\%)$</p>	<p>M1 A1</p>	<p>Allow sight of 18/100 or 0-18 for M1. M0 for 54/300 alone.</p>
<p>9.(b) Use of $\frac{\text{Distance}}{\text{Time}}$ $\frac{100}{2.5}$ or equivalent $= 40$ (mph)</p>	<p>M1 M1 A1</p>	<p>Allow M1 even for e.g. $100 / 2.3(0)$ or $100/150$. C.A.O.</p>
<p>10. $(a + b = 180 - 25) = 155$ (a =) $\frac{155}{5} \times 2$ OR (b =) $\frac{155}{5} \times 3$ or equivalent $a = 62(^{\circ})$ AND $b = 93(^{\circ})$</p>	<p>B1 M1 A1</p>	<p>B1 for sight of 155 FT 'their stated 155'. Allow M1A0 if the angles are reversed and <u>not</u> corrected.</p>

<p>7.</p> 	<p>B2</p>	<p>B1 for 2 correct answers and 1 incorrect answer B1 for 1 correct answer and 1 incorrect answer B1 for 1 correct answer and 0 incorrect answer</p>
<p>8. Use of 360°, e.g. $8x = 360^\circ$ $(x =) 360/8^\circ$ $(x =) 45^\circ$</p>	<p>B1 M1 A1</p>	<p>M1 implies B1 If B0 M0 A0, award SC1 for $x = 22.5^\circ$ from accurate working from $8x = 180^\circ$</p>
<p>9. (Perimeter of rectangle =) $15+15+7+7$ $= 44$ (cm) (Length of side of square =) $44 \div 4$ (cm) 11 (cm)</p>	<p>M1 A1 M1 A1</p>	<p>FT 'their stated 44', but not 15 or 7.</p>
<p>9. OCW Organisation and Communication</p> <p>Accuracy of Writing</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc
<p>10.(a) $(x =) 180 - 90 - 37$ or equivalent. $= 53^\circ$</p>	<p>M1 A1</p>	
<p>10.(b) $(a =) 51^\circ$ $(b =) 360 - (51 + 82 + 153)$ or equivalent. $= 74^\circ$</p>	<p>B1 M1 A1</p>	<p>FT 'their 51', i.e. $125 -$ 'their 51' provided 'their 51' < 125.</p>
<p>11.(a) $\frac{1}{9}$</p>	<p>B1</p>	
<p>11.(b) 0.016</p>	<p>B1</p>	
<p>11.(c) 0.015</p>	<p>B1</p>	
<p>12.(a) $\frac{1}{10}$ or 0.1</p>	<p>B1</p>	<p>Mark final answer.</p>
<p>12.(b) Sight of 27 AND 4 $(27 \div 4 =) 6.75$</p>	<p>B1 B1</p>	<p>FT if at least 27 or 4 correct and of equivalent difficulty (i.e. <u>not</u> leading to a whole number answer). Answer must be a decimal</p>
<p>13. (Volume =) $5 \times 3 \times 2$ $= 30$ (cm³)</p>	<p>M1 A1</p>	<p>Any additional calculation e.g. $30 \div 2 = 15$ is M0.</p>

<p>13. $5x - 17 + 2x + 9 + x + 20 = 180$ $8x = 168$ $x = 21$</p> <p>Substituting $x = 21$ into at least one expression. $(5x - 17 =) 88(^{\circ})$ $(2x + 9 =) 51(^{\circ})$ $(x + 20 =) 41(^{\circ})$ (So not a right-angled triangle)</p>	<p>M1 A1 A1</p> <p>M1 A1</p>	<p>F.T. from $ax = b$. Allow all 3 marks for $x = 21$.</p> <p>If $x \neq 21$ FT 'their <u>derived</u> value of x'. F.T. for this A1 if $x \geq 4$. Any two of these expressions correctly evaluated with no incorrect evaluation, provided the sum of the two found is > 90. (statement not required). <u>Note</u> If further work indicates that the values found are not treated as angles (e.g. showing $51^2 + 41^2 \neq 88^2$) then award final MOA0.</p>
<p><u>Alternative method</u> $5x - 17 = 90$ OR $2x + 9 = 90$ OR $x + 20 = 90$ $x = 21.4$ AND $x = 40.5$ AND $x = 70$</p> <p>Then verifying: If $x = 21.4$: $5x - 17 + 2x + 9 + x + 20 = 183.2$ AND If $x = 40.5$: $5x - 17 + 2x + 9 + x + 20 = 336$ AND If $x = 70$: $5x - 17 + 2x + 9 + x + 20 = 572$ (So not a right-angled triangle)</p>	<p>M1 A2</p> <p>A2</p>	<p>Award A1 for any one of these: $x = 21.4$ OR $x = 40.5$ OR $x = 70$</p> <p>Award A1 for any one of these: If $x = 21.4$: $5x - 17 + 2x + 9 + x + 20 = 183.2$ OR If $x = 40.5$: $5x - 17 + 2x + 9 + x + 20 = 336$ OR If $x = 70$: $5x - 17 + 2x + 9 + x + 20 = 572$</p>
<p>14. $(AB =) 13.8 \times \cos 41$ OR $13.8 \times \sin 49$ $= 10.4(\dots)$ (cm)</p>	<p>M2 A1</p>	<p>M1 for $\cos 41 = \frac{AB}{13.8}$ OR $\sin 49 = \frac{AB}{13.8}$</p>
<p><u>Alternative method:</u> Correct use of 'two-step' method. $(AB) = 10.4(\dots)$(cm)</p>	<p>M2 A1</p>	<p>A partial trigonometric method is M0. Accept an answer that rounds to 10.4(cm)</p>
<p>15.a(i) $x^3 + 7x$</p>	<p>B2</p>	<p>B1 for sight of $x^3 + \dots$ OR $\dots + 7x$. Do not accept $x \times x \times x + x \times 7$ etc. Mark final answer.</p>
<p>15(a)(ii) $3x^2 - 4x - 15x + 20$ $3x^2 - 19x + 20$</p>	<p>B1 B1</p>	<p>Must be an expression. FT from an error in only one term (out of 4) only if of the form $ax^2 \pm bx \pm cx \pm d$.</p>
<p>15.(b)(i) $5n - 27 < n$ OR $n > 5n - 27$</p>	<p>B2</p>	<p>Allow B2 for an equivalent correct inequality. e.g. $4n - 27 < 0$. B1 if \leq or \geq used in a 'correct' inequality. OR B1 for $5n - 27 > n$ OR $n < 5n - 27$</p>
<p>15.(b)(ii) $4n < 27$ $n < \frac{27}{4}$ (Greatest number of clocks =) 6</p>	<p>B1 B1 B1</p>	<p>FT 'their inequality' if of equivalent difficulty. FT only from an $< b$ OR an $\leq b$ OR an $> b$ OR an $\geq b$. FT only from $n < c$ where c is positive OR $n \leq d$ where d is positive and not an integer An answer of 6 gains all 3 marks.</p>

7.(a) 3a	B1	
7.(b)(i) $(y=) 63$	B1	Accept embedded answer
7.(b)(ii) $(x=) 12$	B1	Accept embedded answer
7 (c) 6	B1	

12. (a)	72		B2	B1 for an appropriate sight of 9 or 8.
12. (b)	-31		B1	
12. (c)	42	ISW	B1	Allow 42·0

<p>14. (a) Any intention of length \times width \times height = 132 e.g. $5x(x^2 + 3) = 132$ $5 \times x \times (x^2 + 3) = 132$ or $5x \times (x^2 + 3) = 132$ or equivalent</p>	<p>B1</p>	<p>Must be = 132. May be seen in parts. Do not allow missing brackets e.g. $5 \times x \times x^2 + 3 = 132$.</p>																																																
<p>14. (b)(i) One correct evaluation $2 \leq x \leq 3$ 2 correct evaluations $2.55 \leq x \leq 2.75$, (one value < 132, one value > 132) 2 correct evaluations $2.55 \leq x \leq 2.65$, (one value < 132, one value > 132) $x = 2.6$</p>	<p>B1 B1 M1 A1</p>	<p><i>Correct evaluation regarded as enough to identify if < 132 or > 132. If evaluations not seen accept 'too high' or 'too low'. Look out for testing $5x^3 + 15x - 132 = 0$ or $x^3 + 3x = 26.4$ or equivalent</i></p> <table border="0"> <tr> <td>x</td> <td>$5x^3 + 15x$</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>70</td> <td></td> <td></td> </tr> <tr> <td>2.1</td> <td>77.805</td> <td></td> <td></td> </tr> <tr> <td>2.2</td> <td>86.24</td> <td></td> <td></td> </tr> <tr> <td>2.3</td> <td>95.335</td> <td></td> <td></td> </tr> <tr> <td>2.4</td> <td>105.12</td> <td></td> <td></td> </tr> <tr> <td>2.5</td> <td>115.625</td> <td>2.55</td> <td>121.1568...</td> </tr> <tr> <td>2.6</td> <td>126.88</td> <td>2.65</td> <td>132.798.....</td> </tr> <tr> <td>2.7</td> <td>138.915</td> <td>2.75</td> <td>145.234.....</td> </tr> <tr> <td>2.8</td> <td>151.76</td> <td></td> <td></td> </tr> <tr> <td>2.9</td> <td>165.445</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>180</td> <td></td> <td></td> </tr> </table>	x	$5x^3 + 15x$			2	70			2.1	77.805			2.2	86.24			2.3	95.335			2.4	105.12			2.5	115.625	2.55	121.1568...	2.6	126.88	2.65	132.798.....	2.7	138.915	2.75	145.234.....	2.8	151.76			2.9	165.445			3	180		
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<p>14. (b)(ii) An answer in the range 9.76 to 10.16 (cm)</p>	<p>B1</p>	<p>Answer may be shown on the diagram. FT 'their $2.6^2 + 3$. FT $132 \div (5 \times \text{'their } x')$.</p>																																																

17. (a)		$7.2 \times 10^6 \text{ cm}^3$	B1	
17. (b)	6		B1	

3(b)(i)	$\frac{115}{360}$	B1	
3(b)(ii) Gold $20^\circ \pm 2^\circ$		B1	Check the diagram
$1800 \times \frac{20 (\pm 2)}{360}$ or $5 \times (20 (\pm 2))$ or equivalent		M1	Also implies previous B1 FT for any value used for '20' provided $\neq 180^\circ$ and $< 360^\circ$ for M1 only (including use of 160°)
100 (gold medals)		A1	A correct answer from using $20^\circ \pm 2^\circ$ in the inclusive range 90 to 110 (gold medals), not from premature approximation ($20/360 = 0.05$, then $0.05 \times 1800 = 90$ B1 M1 A0)

<p>5(a) (North orchard, number of pear trees is) $3 \times 35 + (4 + 3)$ or 3×5 or equivalent 15 (pear trees) (West orchard number of pear trees is 2×15) 30 (pear trees)</p> <p>(West orchard number of cherry trees is) $11 \times 30 \div 5$</p> <p>66 (cherry trees)</p>	<p>M1 A1 B1 M1 A1</p>	<p>FT 'their derived 15'</p> <p>FT 'their derived number of pear trees' Allow M1 for a final answer of 88 (cherry trees from use of 40 apple trees as pear trees), but A0</p> <p>FT answer must be evaluated correctly and lead to a whole number</p>
<p>5(b) (Mass of apples to make juice) 5280 $+ 6$ $+ 2.2$ 400 (kg)</p> <p>(Number of litres of juice produced) $400 \times 2 \div 5$ or $2 \div (5 \div 400)$ or $2 \times \frac{400}{5}$</p> <p>160 (litres)</p>	<p>M1 M1 A2 M1 A1</p>	<p>Method may be seen in either order M0 for statement '1/6 of 5280' without calculation</p> <p>Ignore incorrect units given May be seen or implied in later working</p> <p>A1 for any one of the following:</p> <ul style="list-style-type: none"> • $(5280 \div 2.2 =) 2400$ • $(5280 \div 6 =) 880$ • a correct evaluation of 'their 2400' + 6 • a correct evaluation of 'their 880' + 2.2 <p>FT 'their derived 400(kg)' (not 5280) If 'their derived 400' is used as g (rather than kg) allow M1 for 'their derived 400' $\times 2 + 5000$ or $2 \div (5000 \div \text{'their derived 400'})$, but A0</p>
<p>5(b) <u>Alternative method</u> (Mass of apples used to make juice) $5280 \div 6$ 880 (lbs)</p> <p>(Mass of apples in 2 litres) 5×2.2 11 (lbs)</p> <p>(Number of litres of juice produced) $2 \times 880 \div 11$ 160 (litres)</p>	<p>M1 A1 M1 A1 M1 A1</p>	<p>FT 'their derived 880' and 'their derived 11'</p>
<p>5(c)(i) <u>Method 1 for 200 jars</u> (Cost of 200 jars) $200 \times (0.)23$ OR (Sales of 200 jars of jam) $200 \times 1(.)60$</p> <p>(Cost of 200 jars) 4600(p) or (£)46 (Sales of 200 jars of jam) 32000(p) or (£)320</p> <p>(Cost 200 jars + jam) $(£94 + £46 =) (£)140$ or 14000(p)</p> <p>(Profit $£320 - £140 =) 18000(p)$ or (£)180</p>	<p>M1 A1 A1 B1 B1</p>	<p>FT £94 + 'their derived £46'</p> <p>If units are given they must be correct FT 'their derived £320' – 'their derived £140'</p>

<p>5(c)(i) <u>Method 2 for 200 jars</u> (Cost of jam for 200 jars) $200 \times (1(.).60 - 0(.).23)$ $(=) \text{ £} 274 \text{ or } 27400(p)$ (Profit $\text{£}274 - \text{£}94 = \text{£}180$) or $\text{£}180$</p>	<p>M2 A2 B1</p>	<p>M1 for $1(.).60 - 0(.).23$ or $\text{£}1.37$ or $137(p)$ A1 for $200 \times 1(.).37$ If units are given they must be correct FT 'their derived $\text{£}274' - \text{£}94$</p>
<p>5(c)(i) <u>Method for 1 jar</u> (Cost of ingredients for 1 jar of jam) $94(00) \div 200$ $47(p)$ or $\text{£}0.47$ (Cost of jam and jar) $(23p + 47p =) 70(p)$ or $\text{£}0.7(0)$ (Profit for 1 jar of jam $\text{£}1.60 - 70p =) 90(p)$ or $\text{£}0.9(0)$ (Profit for 200 jars of jam) $18000(p)$ or $\text{£}180$</p>	<p>M1 A1 B1 B1 B1</p>	<p>FT 'their derived $47p' + 23p$ FT $\text{£}1.60 - \text{'their derived } 70p'$ May be seen or implied in later working If units are given they must be correct FT 'their derived $90p'$</p>
<p>5(c)(ii) $3 \times 48 \div 8$ or equivalent 18 (cm)</p>	<p>M1 A1</p>	

6(a) (Direct ² =) $200^2 + 350^2$ Direct ² = 162500 or (Direct =) $\sqrt{162500}$	M1 A1	
(Direct =) $403(.11\dots \text{ m})$ or $50\sqrt{65} \text{ (m)}$ or $\sqrt{162500} \text{ (m)}$	A1	FT from M1 for the correctly evaluated square root of 'their 162500' provided 'their answer' > 350 (m) May be implied in further working Mark final answer or the answer they go on to use, but then FT
(Extra distance =) $200 + 350 - 403(.1\dots)$ or $200 + 350 - 50\sqrt{65}$ or $200 + 350 - \sqrt{162500}$	M1	FT 'their derived $403(.11\dots)$ ' > 350 and from an attempt to use Pythagoras' Theorem
$146.8(87\dots\text{m})$ or $146.9(\text{m})$ or $147(\text{m})$	A1	

<p>6(b)(i) Selects or unambiguously implies 'No' with a reason, e.g. 'the median is in group >200m to 1000m (and he lives 200m away)', 'median is more than 200m away (but Ronnie is 200m away)'</p>	<p>E1</p>	<p>Needs to compare 200(m) with median >200(m) The 200(m) can be implied from selecting 'No'</p> <p>Ignore additional spurious statements</p> <p>Allow 'No' with a reason, e.g. 'Ronnie's distance is in the first group, the median is in the second group' 'Ronnie only travels 200m which is less than the median (distance)' 'because the median distance travelled is between 200m and 1000m' 'Ronnie doesn't travel the distance of the 17.5(th) person' 'Ronnie doesn't travel the distance of the 17(th) (or 18th) person' 'the median 17.5(th)' 'the median 17(th) (or 18(th))' 'he only walks 200m when the (median) distance is higher' 'he only walks 200m which is less than the median' 'can't estimate exact number from the group $200 < d \leq 1000$ 'the median could be 880' '9 less than half of 35' '26 students walk further than him'</p> <p>Do not accept 'No' with a reason e.g. 'Ronnie's distance is in the first group' 'the median is 250m'</p>														
<p>6(b)(ii) Midpoints 150, 600, 2000, 5000</p> $150 \times 9 + 600 \times 10 + 2000 \times 15 + 5000 \times 1$ <p>(= 1350 + 6000 + 30000 + 5000 = 42350 m)</p> <p style="text-align: right;">÷ 35</p> <p style="text-align: right;">1210 (m)</p>	<p>B1</p> <p>M1</p> <p>m1</p> <p>A1</p>	<p>Check the table Sight of 7750 implies correct midpoints</p> <p>FT 'their midpoints' provided at least 3 are within or at the bounds of the appropriate groups</p> <p>Answer space takes precedence</p>														
<p>6(c) $(140 \div 7 =) 20$ or $140 \div 20 = 7$ or $7 \times 20 = 140$</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td> </tr> <tr> <td>2</td><td>22</td><td>42</td><td>62</td><td>82</td><td>102</td><td>122</td> </tr> </table>	1	2	3	4	5	6	7	2	22	42	62	82	102	122	<p>B1</p> <p>B1</p>	<p>May be implied by any of the following:</p> <ul style="list-style-type: none"> • consistent position patterns + 20 indicated for at least 4 consecutive positions e.g. (2,) 20, 40, 60, 80, 100, 120 • sight of 22 for student 2 with no further working or entries <p>CAO</p>
1	2	3	4	5	6	7										
2	22	42	62	82	102	122										

<p>7(a) Whiskers at 3 m and 22 m</p> <p>Unambiguous values or box with LQ 5 m and UQ 20 m</p> <p>Median at 15 m</p>	<p>B1</p> <p>B1</p> <p>B1</p>	<p>Ignore if lines omitted from the ends of the whiskers Must be the least and greatest values shown</p> <p>May be seen in working, must be clearly LQ and UQ Check cumulative frequency diagram If not clearly labelled in working or on the graph, they must be no other values given between</p> <ul style="list-style-type: none"> • the least and the LQ, and • the greatest and the UQ <p>May be seen in working, must be clearly the median Check cumulative frequency diagram If not an unambiguous unique line or point, i.e. not clearly labelled in working or on the graph, allow for a line (or point) indicated that is not the least or greatest value shown</p> <p>Only if B1 B1 B1 awarded, <u>penalise -1</u> if a correct format for a box-and-whisker diagram is not shown</p>
<p>7(b)(i) 0.75×68 or equivalent 51 (yachts)</p>	<p>M1</p> <p>A1</p>	<p>Answer space takes precedence If no marks, award SC1 for sight of 17 (from 0.25×68)</p>
<p>7(b)(ii) Conclusion 'Eog' with sight of (Eog IQR $20 - 5 = 15$ (m) AND (Clwyd IQR $18 - 10 = 8$ (m)</p>	<p>B2</p>	<p>FT 'their UQ - LQ' from (a) box-and-whisker diagram</p> <p>B1 for either IQR correct</p>
<p>7(b)(iii) Conclusion 'Can't tell' with reason, e.g. 'only know that 25% of yachts in Clwyd Marina are greater than 18m' 'we don't know if any of the yachts in Clwyd Marina are greater than 22(metres, the longest in Eog Marina)' 'we don't know if a yacht in Clwyd Marina is greater than 22(metres)' 'it doesn't say maximum length of Clwyd Marina's results'</p>	<p>E1</p>	<p>Ignore any additional incorrect or spurious statements</p> <p>Allow 'Can't tell' with a reason, e.g. 'no raw data' 'don't know this information' 'doesn't show anywhere the biggest yacht in Clwyd Marina' 'we are only given some of the lengths of the yachts in the marinas' 'doesn't show Clwyd Marina's results' 'not specified' 'not specific' 'range not given for the Clwyd Marina (so can't identify the longest yacht)'</p> <p>Do not accept, e.g. 'don't know how many yachts in the marinas' 'not mentioned for either marina'</p>

8.(a) 7.29 or $\frac{729}{100}$ or $7\frac{29}{100}$	B1	inclusive. B0 for $729 \div 100$.
8.(b) 3.4 or $\frac{17}{5}$ or $3\frac{2}{5}$	B1	B0 for $17 \div 5$.
8.(c) $\frac{60}{100} \times 28$ or equivalent $= 16.8$ or $\frac{84}{5}$ or $16\frac{4}{5}$	M1 A1	M1 A0 for $84 \div 5$.

8.(a) $1 - (0.08 + 0.2 + 0.28)$ or equivalent $= 0.44$ or equivalent.	M1 A1	For the complete method. If no marks awarded, award SC1 for 55 pupils for Ysgol Bryn.
8.(b) 0.28×125 or equivalent. $= 35$ ISW	M1 A1	Unsupported $35/125$ or equivalent implies M1A0.

10.	$\frac{20 \times 60}{400}$ or $\frac{20 \times 59}{400}$	M1	May be seen in stages.
	= 3 or 2.95	A1	CAO. Unsupported answer is M0 A0.

10.(a) $\frac{21.76}{32} (\times 100\%)$ or equivalent $= 68 (\%)$	M1 A1	Allow 0.68 to imply M1.
10.(b) $5t - 3t = 14 - 3$ OR $3 - 14 = 3t - 5t$ $2t = 11$ OR $-11 = -2t$ $t = \frac{11}{2}$ or equivalent	B1 B1 B1	FT until 2 nd error. Mark final answer. Correct answer implies B1B1B1. Do not allow $-t = -11/2$ or $t = -11/-2$. A final answer of '11 ÷ 2' is B1B1B0. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise, accept a fraction. Allow B1B1B1 for a correct embedded answer BUT only B1B1B0 if contradicted by $t \neq 11/2$ or equivalent.

16.(b)	0.28×125 or equivalent. = 35 ISW	M1 A1	Unsupported $35/125$ or equivalent implies M1A0.
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18.(a) $\frac{21.76}{32} (\times 100\%) \text{ or equivalent}$ $= 68 (\%)$	M1 A1	Allow 0.68 to imply M1.
18.(b) $5t - 3t = 14 - 3 \text{ OR } 3 - 14 = 3t - 5t$ $2t = 11 \quad \text{OR} \quad -11 = -2t$ $t = \frac{11}{2} \text{ or equivalent}$	B1 B1 B1	FT until 2 nd error. Mark final answer. Correct answer implies B1B1B1. Do not allow $-t = -11/2$ or $t = -11/-2$. A final answer of '11 ÷ 2' is B1B1B0. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise, accept a fraction. Allow B1B1B1 for a correct embedded answer BUT only B1B1B0 if contradicted by $t \neq 11/2$ or equivalent.

4.(b) 3 OR -3	B1	B0 for 3 × 3
4.(c) $\frac{40}{100} \times 120$ or equivalent	M1	Other possible methods for M1 include <ul style="list-style-type: none">• 10% is 12 so 40% is 4 × 12• 0.4 × 120• 120 × 4/10. Allow M1 for sight of four 12s, either written in a column or row.
48	A1	M0 for 12 alone M1A0 for 48 followed by 72 or 168. SC1 for unsupported 72 or 168.

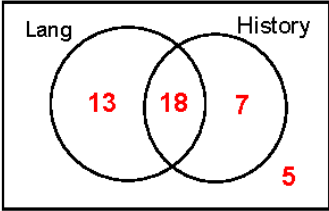
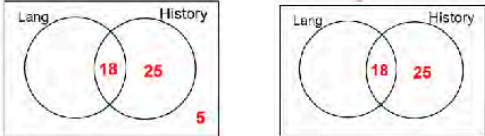
8.(a) (£) $15m$	B1	Mark final answer Accept $m15$, $15\times m$, $m\times 15$
8.(b) $20 - k$ (oranges)	B1	Mark final answer

<p>8. Identifying 12 possible combinations</p> <p>Identifying the 3 correct combinations that give a score of 6 or more (2 and 4, 3 and 3, 3 and 4)</p> <p>(Probability of '6 or more' =) $\frac{3}{12}$ or equivalent ISW (but note comment for M1 below)</p> <p>(Number of winning scores =) $\frac{3}{12} \times 60$ or equivalent</p> <p style="text-align: right;">= 15</p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Award B1 for convincing identification of the 12 combinations, for example:</p> <ul style="list-style-type: none"> • simply stating 12 • $(3 \times 4 =) 12$ • showing all combinations 1+1, 1+2, etc. • all 12 'totals' • (2,3,3,4,4,4,5,5,5,6,6,7) shown with no extras • completed sample space drawn (3 by 4). <p>Strict FT only if a list of all possible scores previously stated.</p> <p>A fraction with a denominator of 12 implies the first B1. Unsupported $\frac{3}{12}$ or equivalent implies previous B1B1. Probability may be implied in later working (e.g. $60 \div 12 = 5$, $5 \times 3 = 15$). FT if a clear numerator and denominator can be identified from previous work. e.g. Possible scores 2, 3, 4, 5, 6, 7 (B0) 2 scores of 6 or more (B1 FT) Probability = $\frac{2}{6}$ (B1 FT)</p> <p>FT 'their $\frac{3}{12}$' If 'their $\frac{3}{12}$' incorrectly simplified and used then award B0 previously.</p> <p>Must not come from incorrect working. Award M1 A0 for a final answer of $(\frac{3}{12} =) \frac{15}{60}$ Note: using 'a winning score of 6' instead of 'a winning score of 6 or more' can be awarded a maximum of B1B0B1M1A1.</p>
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12.(a) $P(\text{Bronze}) = 0.2$ AND $P(\text{No Prize}) = 0.6$ or equivalent	B2	The values in the table takes precedence. Award B1 for one of the following: <ul style="list-style-type: none"> • $P(\text{Bronze}) = 0.2$ (must be clearly identified) • $P(\text{No Prize}) = 0.6$ • $P(\text{Bronze}) + P(\text{No Prize}) = 0.8$ • $P(\text{Bronze}) = \frac{1}{3} P(\text{No Prize})$ provided both < 1.
12.(b) $15 \div 0.02 \times 0.18$ or 15×9 or equivalent $= 135$	M1 A1	Must be for a complete method e.g. <ul style="list-style-type: none"> • $15 \div 2 = 7.5$ $7.5 \times 18 = 135$ • $750 - (450 + 150 + 15)$ • $0.02 : 0.18$ $15 : 135$ (e.g 0.18×750, or 15×9) Award M1 A1 for a final answer of $15 : 135$. Sight of 135 as a numerator in a fraction < 1 implies M1A0.

19.(b)	Use of $\frac{45}{9}$ or equivalent	M1	Sight of an appropriate 5 (or 40) implies M1.
	(£)40 AND (£)5	A1	Accept in either order.

19.(a)	7.6×10^{-3}	B1	
19.(b)	6×10^5	B1	
19.(c)	2.8×10^4	B2	Mark final answer. Award B1 for one of the following: <ul style="list-style-type: none">• sight of 28×10^3• sight of 28 000• equivalent correct value but not in standard form• sight of 23 000 AND 5000• 'their 28000' is written correctly in standard form, following one place value error in one of the numbers from work seen.

<p>19.(a)</p>  <p>5 AND 18 in correct position.</p> <p>Total of 25 for <i>History</i>.</p> <p>Overall total of 43</p>	<p>Diagram takes precedence. If 'notches/tallies' are used, penalise –1 once.</p> <p>B1 Award B0 for one of the following:</p> <ul style="list-style-type: none"> any other number written in the same section 4 and 1 written for 5. <p>B1 FT 'their 7' + 'their 18', provided both sections are non-zero and no section is blank.</p> <p>B1 FT 'their 13' + 'their 18' + 'their 7' + 'their 5' provided all sections are non-zero and no section is blank.</p> <p>Note: The following answers are awarded</p>  <p>B1B0B0 B0B0B0</p>
<p>19.(b)</p> <p>$\frac{31}{43}$ or equivalent. ISW</p>	<p>For B2 or B1, the numerator and denominator must both be whole numbers.</p> <p>B2 For B2, accept:</p> <ul style="list-style-type: none"> 72·0(9...) % or 0·720(9...). 72·1% or 0·721 72% or 0·72 from correct working. <p>FT 'their 13' + 'their 18' provided neither section is blank.</p> <p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> a numerator of 31 in a fraction < 1 FT 'their 13' + 'their 18', provided neither section is blank, as a numerator in a fraction < 1 a denominator of 43 in a fraction < 1. <p>An answer of $\frac{31}{43}$ gains B2 regardless of 'their Venn diagram'.</p> <p>Penalise incorrect notation (e.g. '31 in 43') –1.</p>

<p>4.(a)</p> $9 \cdot 17 \div 7 \times 3 \text{ or equivalent}$ $3 \cdot 93 \text{ (km)}$ 3930 (m)	<p>M1 A1 B1</p>	<p>Answer space takes precedence. May be seen in stages. FT 'their 3·93' × 1000.</p>
<p>4.(a) <u>Alternative method (converting to m first)</u></p> 9170 (m) $9170 \div 7 \times 3 \text{ or equivalent}$ 3930 (m)	<p>B1 M1 A1</p>	<p>Answer space takes precedence. FT 'their 9170' ÷ 7 × 3 provided that the digits 917 are seen (i.e place value error).</p>
<p>4.(b)</p> $\frac{25}{2 \times 60 + 5} \text{ (} \times 100\% \text{) or equivalent}$ $= 20 \text{ (}\% \text{)}$	<p>M2 A1</p>	<p>Allow 0·2 or $\frac{1}{125 \div 25}$ or $\frac{1}{5}$ to imply M2. Award M1 for an attempt at $\frac{25}{2 \text{ hours } 5 \text{ minutes}}$ but with incorrect denominator (e.g. 2·5, 2·05, 2 hours 5 minutes stated incorrectly with $2 \times 60 + 5$ not shown). CAO Mark final answer. If no marks awarded, award SC1 for sight of 125 (minutes).</p>
<p>4.(b). <u>Alternative Method</u></p> $125 \text{ minutes} = (100\%)$ $12 \cdot 5 \text{ minutes} = 10\%$ $25 \text{ minutes} = 20\%$	<p>B1 M1 A1</p>	<p>CAO Mark final answer.</p>

4. Showing (65%), 60%, 86%, (80%)
 OR 65/100, 60/100, 86/100, 80/100
 OR 6.5/10, (6/10) 8.6/10, 8/10
 OR 0.65, 0.6(0), 0.86, 0.8(0)
 OR four correct calculations for a common amount

	Lowest → Highest			
Subject	English	Maths	PE	History
Result	6/10	65%	80%	43/50

B2 Values may be shown in working or in the table
 B2 for all correct % OR all correct decimals
 all correct fractions with a common denominator
 OR correct work using a common amount
 OR a valid combination that allows full comparison
 e.g. $6/10 = 60%$ and $80% = 40/50$

B1 for one correct conversion that allows a comparison with another value

B1 Allow any unambiguous indication (e.g. 'converted values').
 FT 'their converted values' only if at least B1 previously awarded

If no marks awarded, award SC1 for any one of the following:

- a correct order of given values i.e. 6/10, 65%, 80%, 43/50 (ignore subjects)
- a correct order of subjects i.e. English, Maths, PE, History (can ignore any values given)

<p>4(a)</p> <p>$\frac{1}{5}$ is \$40, total amount of gift is) 40×5 or $40 \div \frac{1}{5}$</p> <p style="text-align: right;">(\$)200</p> <p>(Amount gifted to animal charity is $\frac{1}{4} \times 200$) (\$)50</p> <p>(Gift to medical research is) (\$) $200 - 40 - 50$</p> <p style="text-align: right;">(\$) 110</p>	<p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Ignore \$ written as £ or €, etc</p> <p>ISW</p> <p>FT $\frac{1}{4} \times$ 'their 200' correctly evaluated, provided</p> <ul style="list-style-type: none"> 'their 200' $\neq 40$ 'their 200' $\neq 200 - 40 (= 160)$ <p>Allow FT 'their 200' = 8 (see note below)</p> <p>FT 'their derived 200' - 40 - 'their 50', provided > 0</p> <p>FT provided both M marks previously awarded</p> <p><i>If no marks, award SC1 for</i> $(40 - \frac{1}{5} \times 40 - \frac{1}{4} \times 40 = 40 - 8 - 10 =) (\\$)22$</p>
<p>4(a) <u>Alternative method</u></p> <p>(Total amount of gift is) 40×5 or $40 \div \frac{1}{5}$</p> <p style="text-align: right;">(\$)200</p> <p>(Proportion given to medical charity)</p> <p>$(1 - \frac{1}{5} - \frac{1}{4} =)$ $\frac{11}{20}$</p> <p>or $(1 - 0.2 - 0.25 =)$ 0.55</p> <p>or $(100 - 20 - 25 =)$ $55 (\%)$</p> <p>(Gift to medical research is) $\frac{11}{20} \times 200$</p> <p style="text-align: right;">or $200 - \frac{9}{20} \times 200$</p> <p style="text-align: right;">(\$) 110</p>	<p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Ignore \$ written as £ or €, etc</p> <p>ISW</p> <p>Allow for proportion given to children's and animal charity clearly shown as</p> <p>$\frac{9}{20}$, 0.45 or 45 (%)</p> <p>FT 'their incorrectly evaluated $1 - \frac{1}{5} - \frac{1}{4}$' or</p> <p>'their incorrectly evaluated $\frac{1}{5} + \frac{1}{4}$ as appropriate and 'their derived 200', provided</p> <ul style="list-style-type: none"> 'their 200' $\neq 40$ 'their 200' $\neq 200 - 40 (= 160)$ <p>Allow FT 'their 200' = 8</p> <p>FT provided both M marks previously awarded</p>
<p>4(a) Organisation and communication</p> <p>Writing</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> present their response in a structured way explain to the reader what they are doing at each step of their response lay out their explanations and working in a way that is clear and logical write a conclusion that draws together their results and explains what their answer means <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> show all their working make few, if any, errors in spelling, punctuation and grammar use correct mathematical form in their working use appropriate terminology, units, etc.

4(b)

Sight of 30 000 – 10 000 or 20 000

 $(30\,000 - 10\,000) \times 0.22$ or $20\,000 \times 0.22$
or equivalent

(\$) 4400

B1

Ignore incorrect units given throughout

M1

Any repeated addition method of 10% and 1% must
clearly show addition to 22%

A1

CAO. Mark final answer

5(a) a = 54° b = 54° c = 78°	B1 B1 B1	Answer spaces take precedence, if blank check the diagram FT 'their a' FT 132 – 'their a' or 132 – 'their b'
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<p>5(b)(i) (Number of revolutions is) $\frac{1000}{\pi \times 29 \div 12}$ or $\frac{1000 \times 12}{\pi \times 29}$ or equivalent</p> <p>Answer in the inclusive range 131 to 132 (revolutions)</p>	<p>M3</p> <p>A1</p>	<p>Complete method May be seen in stages</p> <p>M2 for any one of the following, or equivalents:</p> <ul style="list-style-type: none"> • $\pi \times 29 \div 12$ • $\frac{1000}{\pi \times 29}$ • $\frac{\pi \times 29}{1000 \times 12}$ • $\frac{1000}{\pi \times (29 \div 2) \div 12}$ • $\frac{1000}{\pi \times (2 \times 29) \div 12}$ <p>M1 for any one of the following, that may be embedded in other working:</p> <ul style="list-style-type: none"> • $29 \div 12$ (= 2.4(1666...)) • 1000×12 (= 12000) • $\pi \times 29$ (= 91.06 to 91.118) • $\frac{1000}{\pi \times n \div 12}$ where $n \neq 0$, e.g. $1000 \times 12 \div (\pi \times 29^2)$ • $\frac{1000}{29 \div 12}$ (= 413.79...) • $1000 \times 12 \div 29$ (= 413.79...) <p>CAO</p>
<p>5(b)(ii) $(10 \times) 29 \times 30 \div 12$ or equivalent or for an answer of 72.5</p> <p>725 (mm)</p>	<p>M2</p> <p>A1</p>	<p>Allow embedded with an incorrect change of units Allow $(10 \times) 2.4(16\dots) \times 30$</p> <p>M1 for any one of the following:</p> <ul style="list-style-type: none"> • $30 \div 12$ (= 2.5) • $29 \div 12$ (= 2.4166...) • sight of 2.4, 2.41, 2.416(6...) or 2.42 • sight of (1 inch =) 2.5 (cm) <p>Answer space takes precedence Allow answers in the range 720 (mm) to 726 (mm) from premature approximation, not from incorrect working</p>
<p>5(c) (Average speed in km/h =) $\frac{48}{1.5}$ or equivalent</p> <p>32 (km/h)</p>	<p>M2</p> <p>A1</p>	<p>M1 for sight of $\frac{48}{1.3}$ or $\frac{48}{90}$ or for answers of 36.9(...) or 37 or 0.53(33...)</p> <p>CAO. Answer space takes precedence</p>

6. (Hours worked on Friday =) 4·5 (hours)	B2	Answer space takes precedence. Mark final answer. Accept $4\frac{1}{2}$ (hours). Award B1 for sight of one of the following: <ul style="list-style-type: none">• Correct time given but not in hours (e.g 4 hours 30 mins, 270 minutes)• 9 (hours for M,T,W) from correct working• method to arrive at hours for full day (e.g. $4x = 36$)• method to arrive at hours for half day (e.g. $8y = 36$)• 4·5 seen but then incorrect workings seen (e.g 4 hours 50 minutes, 4 hours 30).
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7(a) $8 \times 1172 \div 5$ or 1172×1.6 1875.2 (km)	M1 A1	Do not allow 1172×1.5 Accept 1875 (km) from correct working Answer space takes precedence
7(b) $0.366 \times 1000 \div 60$ 6.1 (m/s)	M1 A1	Accept 6 (m/s) from correct working Answer space takes precedence

<p>7(c) (Difference 60 million – 41 000 000 =) 19 000 000 or 19 million</p> <p>(Underspend) $\frac{19\,000\,000}{60\,000\,000} (\times 100)$ or equivalent</p> <p style="text-align: right;">31.67(%)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>May be implied in further working Allow 19 m(il)</p> <p>FT 'their 60 million – 41 000 000' including if a place value error made</p> <p>CAO (must be 2 d.p.)</p> <p>Answer space takes precedence</p>
<p>7(c) <u>Alternative method</u> (Underspend)</p> <p>$(100 -) \frac{41\,000\,000}{60\,000\,000} (\times 100)$ or equivalent</p> <p style="text-align: right;">31.67(%)</p>	<p>M1</p> <p>A2</p>	<p>Allow place value error</p> <p>CAO (must be 2 d.p.) Answer space takes precedence</p> <p>A1 for 31.6(6...%), 31.7(%), 32(%) or 68.33(%)</p>
<p>7(d) 4×10^6</p>	<p>B1</p>	
<p>7(e) (Change to \$) 350×1.25</p> <p style="text-align: right;">(\$)437.5(0)</p> <p>(Only \$10 and \$50 notes available so he can buy) (\$)430</p> <p>(Fewest number of notes making up \$430) 8 \$50 (notes) and 3 \$10 (notes)</p> <p>(Cost in £ to buy \$430 is) $430 \div 1.25$ or $350 - 7.5(0) \div 1.25 (= 350 - 6)$</p> <p style="text-align: right;">(£)344</p>	<p>M1</p> <p>A1</p> <p>A1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p><i>Do not penalise slips in giving incorrect use of £ for \$</i></p> <p>FT 'their (\$)437.5(0)' (provided not a multiple of 10) rounded down to nearest multiple of 10 Accept stated or implied as (\$)7.50 can't be converted (\$)430 implies previous M1 A1, provided not from incorrect working</p> <p>FT 'their \$430' provided it is a multiple of 10 (and provided M1 previously awarded) Must be fewest number of notes, that may be listed Sight of correct number of notes with no incorrect working implies previous A1, unless contradicted</p> <p>FT 'their whole number multiple of \$10' $\div 1.25$ Ignore attempt at any further calculation if $430 \div 1.25$ seen</p> <p>Must be <(£)350 and depends on M1 M1 previously awarded Mark final answer</p> <p>If final M0 A0, then award SC1 for (£) 6 (left) or similar on FT, provided not from incorrect or inappropriate working</p>
<p>7(e) <u>Alternative method</u> $\pounds 40 = \\$50$ and $\pounds 8 = \\$10$ 8 \$50 notes, 3 \$10 notes</p> <p>(Cost to buy £350 is) $8 \times 40 + 3 \times 8$</p> <p style="text-align: right;">(£)344</p>	<p>M1</p> <p>A3</p> <p>M1</p> <p>A1</p>	<p>A2 for 8 \$50 notes and sight of $350 - 8 \times 40$ or equivalent</p> <p>OR</p> <p>A1 for 8 \$50 notes</p>

(=) 1631 (seconds)	A1	
8.(a) 7000	B2	B1 for sight of 7200.
8.(b) $0.04 \times (\pounds)250$ or equivalent	M1	
(\pounds) 10 ISW	A1	
8.(c) 14×5 or equivalent (= 70) $70 \div 2$ or equivalent	M1 m1	FT 'their $14 \times 5 \div 2$
= 35	A1	CAO
<u>8.(c) Alternative method 1</u> $1/5 = 20\%$ AND $10\% = 7$ 7×5	B1 M1	FT 'their 7' provided $1/5$ has been considered along with 50(%)
= 35	A1	CAO
<u>8.(c) Alternative method 2</u> 14×2.5	M2	May be seen in stages. e.g. $14 + 14 + 0.5 \times 14$
= 35	A1	CAO

<p>8(a)</p> <p>$\frac{1}{5}$ is \$40, total amount of gift is) 40×5 or $40 \div \frac{1}{5}$</p> <p style="text-align: right;">(\$)200</p> <p>(Amount gifted to animal charity is $\frac{1}{4} \times 200$) (\$)50</p> <p>(Gift to medical research is) (\$) $200 - 40 - 50$</p> <p style="text-align: right;">(\$) 110</p>	<p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Ignore \$ written as £ or €, etc</p> <p>ISW</p> <p>FT $\frac{1}{4} \times$ 'their 200' correctly evaluated, provided</p> <ul style="list-style-type: none"> 'their 200' $\neq 40$ 'their 200' $\neq 200 - 40 (= 160)$ <p>Allow FT 'their 200' = 8 (see note below)</p> <p>FT 'their derived 200' - 40 - 'their 50', provided > 0</p> <p>FT provided both M marks previously awarded</p> <p><i>If no marks, award SC1 for</i> $(40 - \frac{1}{5} \times 40 - \frac{1}{4} \times 40 = 40 - 8 - 10 =) (\\$)22$</p>
<p>8(a) <u>Alternative method</u></p> <p>(Total amount of gift is) 40×5 or $40 \div \frac{1}{5}$</p> <p style="text-align: right;">(\$)200</p> <p>(Proportion given to medical charity)</p> <p>$(1 - \frac{1}{5} - \frac{1}{4} =)$ $\frac{11}{20}$</p> <p>or $(1 - 0.2 - 0.25 =)$ 0.55</p> <p>or $(100 - 20 - 25 =)$ 55 (%)</p> <p>(Gift to medical research is) $\frac{11}{20} \times 200$</p> <p style="text-align: right;">or $200 - \frac{9}{20} \times 200$</p> <p style="text-align: right;">(\$) 110</p>	<p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Ignore \$ written as £ or €, etc</p> <p>ISW</p> <p>Allow for proportion given to children's and animal charity clearly shown as $\frac{9}{20}$, 0.45 or 45 (%)</p> <p>FT 'their incorrectly evaluated $1 - \frac{1}{5} - \frac{1}{4}$' or 'their incorrectly evaluated $\frac{1}{5} + \frac{1}{4}$ as appropriate and 'their derived 200', provided</p> <ul style="list-style-type: none"> 'their 200' $\neq 40$ 'their 200' $\neq 200 - 40 (= 160)$ <p>Allow FT 'their 200' = 8</p> <p>FT provided both M marks previously awarded</p>

8(b) Sight of 30 000 – 10 000 or 20 000	B1	Ignore incorrect units given throughout
$(30\,000 - 10\,000) \times 0.22$ or $20\,000 \times 0.22$ or equivalent	M1	Any repeated addition method of 10% and 1% must clearly show addition to 22%
(\$) 4400	A1	CAO. Mark final answer

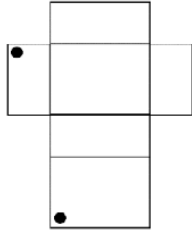
<p>8(a)(i) (2.5, 42) stated with a suitable line of best fit drawn through this point</p>	<p>B2</p>	<p>For B2 do not ignore the answer space stating an incorrect point, or giving reverse coordinates</p> <p>Conditions of a suitable line of best fit:</p> <ul style="list-style-type: none"> • The straight line (accept intention if a ruler is not used) must have points above and below it • The line must be of sufficient length, to illustrate trend for at least 6 points • The trend shows that there are points above and below the line towards each end of the line <p>For B2 the point (2.5, 42) must be stated or plotted with a suitable line of best fit through this point. If (2.5, 42) is not stated or plotted, then it is only possible to award a maximum of B1</p> <p>Allow B2 for one of the following:</p> <ul style="list-style-type: none"> • a blank answer space with (2.5, 42) plotted with a suitable line of best fit through (2.5, 42) • (2.5, 42) stated in the answer space, but not plotted, with suitable line of best fit passing through (2.5, 42) <p>B1 for sight of any one of the following:</p> <ul style="list-style-type: none"> • (2.5, 42) stated in the answer space • blank answer space with (2.5, 42) indicated by a correct plot • A suitable line of best fit for the given points: <ul style="list-style-type: none"> ○ with no additional point plotted ○ passing through 'their additional incorrect point' (plotted) ○ suitable if 'their additional incorrect point' plotted is ignored
<p>8(a)(ii) Reading from line of best fit for number of cups (tolerance to the nearest gridline) for rainfall of 2.0 mm</p>	<p>B1</p>	<p>Answer space takes precedence STRICT FT from (a)(i) 'their line of best fit' which must be drawn for negative correlation No mark is awarded if no line of best fit drawn in (a)(i)</p>
<p>8(b) $5 \times 18 + 5 \times 0.5$ or 18.5×5 92.5 (cm)</p>	<p>M1 A1</p>	<p>Allow for $18 < \text{'their 18.5'} \leq 19$ CAO</p> <p>If no marks, award SC1 for sight of 18.5 (cm) or 18.4999(... cm) provided clearly a recurring 9 digit</p>
<p>8(c) Selects or unambiguously implies 'No' with a reason, e.g. '(Space) minimum 97.25 (cm) (which is less than 97.3 cm)'</p>	<p>E1</p>	<p>Allow 'No' with a reason, e.g. '97.25 (cm)' '(least) 97.25 and (greatest) 97.75'</p> <p>Do not accept 'No' with the reason, e.g. '97.75 (cm)'</p>

<p>8(a)(i) $440 \times 48 \div 2.2$</p> <p style="text-align: right;">9600 (kg)</p>	<p>M1</p> <p>A1</p>	<p>May be seen in stages</p> <p>Mark final answer Allow answers in the inclusive range 9588 to 9601 from premature approximation Answer space takes precedence</p>
<p>8(a)(ii) 230 000 000 000</p>	<p>B1</p>	
<p>8(b)</p> <p>(Area) $2.47 \times 40000 \div 10000$ or equivalent 9.88 (acres)</p> <p>(Density of trees) $615 \div 9.88$ 62(.2...trees per acre) (>60)</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p>Throughout, if 4 marks are awarded, penalise -1 if conclusion 'Yes' is not indicated On FT the conclusion may be different to 'Yes'</p> <p>May be implied in further working Allow 9.8 (acres), 9.9 (acres) or 10 (acres)</p> <p>Depends on M1 m1 previously awarded</p>
<p>8(b) <u>Alternative method 1</u></p> <p>(Area) $2.47 \times 40000 \div 10000$ or equivalent 9.88 (acres)</p> <p>(Maximum number of trees) 9.88×60 592(.8) (trees) or 593 (trees) (< 615)</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p>May be implied in further working Allow 9.8 (acres), 9.9 (acres) or 10 (acres)</p> <p>Depends on M1 m1 previously awarded Allow suitable rounding, e.g. 590 or 600</p>
<p>8(b) <u>Alternative method 2</u></p> <p>(Area) $2.47 \times 40000 \div 10000$ or equivalent 9.88 (acres)</p> <p>(Minimum area) $615 \div 60$ 10.25 (acres) (> 9.88)</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>May be implied in further working Allow 9.8 (acres), 9.9 (acres) or 10 (acres)</p> <p>Do not allow embedded in further working Allow rounded to 10 (acres) provided 'their area' (9.88m²) has not been rounded to 10</p>
<p>8(b) <u>Alternative method 3</u></p> <p>(Minimum area) $615 \div 60$ 10.25 (acres)</p> <p>(Convert to m²) $10000 \times 10.25 \div 2.47$ 41 497(.97 m²) or 41 498(m²) (>40 000)</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p>May be implied in further working Allow 10 (acres)</p> <p>Depends on M1 m1 previously awarded Accept suitable rounding, e.g. 41 000 or 41 500</p>
<p>8(b) <u>Alternative method 4</u></p> <p>(Trees in 2.47 acres) $615 \div (40000 \div 10000)$ or equivalent 153.75 (trees)</p> <p>(Density of trees) $153.75 \div 2.47$ 62(.2...trees per acre) (> 60)</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p>May be implied in further working Allow 153, 153.8 or 154 (trees)</p> <p>Depends on M1 m1 previously awarded</p>
<p>8(b) <u>Alternative method 5</u></p> <p>(Forest area per tree) $40000 \div 615$ 65(.0406.. m²)</p> <p>(Fire risk, area per tree) $10000 \div (60 \times 2.47)$ 67(.476...m²) (> 65)</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>Do not allow embedded in further working</p>

9(a)(i) Entries 146 and 160 in the table and the cumulative frequency diagram completed correctly (correct plots (11, 146) and (13, 160) and all plots joined)	B2	B1 for any one of the following: <ul style="list-style-type: none"> • 146 and 160 in the table, correct plots but not joined • 146 and 160 in the table, with one correct plot and one incorrect plot in completing the cumulative frequency diagram with plots joined • one error in the table, including FT 'their 146' + 14 and these cumulative entries used correctly to complete the cumulative frequency diagram with plots joined • correct cumulative frequency diagram with plots joined, with incorrect, incomplete or not attempted entries in the table
9(a)(ii) 8.2 to 8.4 (minutes)	B1	Answer space takes precedence Allow 8 minutes 12 seconds to 8 minutes 24 seconds FT reading from the graph for 'their median', from $\frac{1}{2} \times$ 'their 160', provided 'their 160' ≥ 110 , with a tolerance of $\frac{1}{2}$ small square from 'their cumulative frequency graph', provided it is possible to read 'their median' from the vertical axis on the graph paper provided
9(a)(iii) 7.2 minutes	B1	Answer space in the statement takes precedence, if blank award for indication of '7.2' (circled) in the list Allow '7' in the answer space provided 7.2 indicated in the list Do not accept '8' in the answer space if 7.2 indicated in the list
9(a)(iv) $\frac{20}{160} (\times 100)$ or $\frac{1}{2} \times 25$ (%) or equivalent 12.5 (%) or 12½ (%)	M1 A1	FT for $(100 \times) 20$ /'their 160', provided 'their 160' > 106 On FT allow rounding or truncation to 1 decimal place
9(b) (Costs are 180 + 220) (£) 400 AND (Profit is 700 – 180 – 220) (£) 300 OR (Receipts / Costs =) $\frac{700}{400} (\times 100)$ (Percentage profit is) $\frac{300}{400} (\times 100)$ or $\frac{700}{400} (\times 100) - 1 (\times 100)$ 75 (%)	B1 M1 A1	May be embedded, e.g. 700 – 400 = 300 (= 1.75 or 175%) FT 'their 400' and 700 – 'their 400' provided their costs or profit are $\neq 180$, $\neq 220$ and $\neq 700$ CAO Allow if all costs and the total are consistently multiplied by 3.
9(c) $8(.)40 \div 1(.)20$ or $8(.)40 - 8(.)40 \div 6$ or equivalent (£) 7 or 700 (p)	M1 A1	Accept a complete and convincing method of trial and improvement If units are given they must be correct Sight of $7 + 1.40 = 8.40$ is awarded M1 A0 unless (£)7 is selected

<p>9(a) (Sale price) $45 - 0.18 \times 45$ or $45 \times (1 - 0.18)$ or $45 - 8.1(0)$ or 45×0.82 <p style="text-align: right;">(£)36.9(0)</p> <p>(Maggie's mum pays) $8 \times 36.9(0) \div (8 + 1)$ or $36.9(0) - 36.9(0) \div (8 + 1)$ $8 \times 4.1(0)$ or $36.9(0) - 4.1(0)$ <p style="text-align: right;">(£)32.8(0)</p> </p></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>May be seen or implied in further working</p> <p>FT 'their £36.90'</p> <p>On FT allow rounded or truncated to a penny</p>
<p>9(a) <u>Alternative method</u> (Maggie's mum's share of original price) $8 \times 45 \div (8 + 1)$ or $45 - 45 \div (8 + 1)$ <p style="text-align: right;">(£) 40</p> <p>(Maggie's mum pays) $40 - 0.18 \times 40$ or $40 \times (1 - 0.18)$ or $40 - 7.2(0)$ or 40×0.82 <p style="text-align: right;">(£)32.8(0)</p> </p></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>May be seen or implied in further working</p> <p>FT 'their £40'</p> <p>On FT allow rounded or truncated to a penny</p>
<p>9(b) (Area) $\frac{1}{2} \times 1.5 \times (3.1 + 4.5)$ <p style="text-align: right;">5.7 (m²)</p> <p>(Charge) $2.5(0) \times 5.7$ <p style="text-align: right;">(£) 14.25</p> </p></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>Accept rounding to 6 (m²) May be seen or implied in further working</p> <p>FT 'their 5.7' (including if previously rounded to 6), including if 'their 5.7' is not an area Allow if 'their area' is costed in parts provided there is an attempt to sum all of the part costs, provided 'their 5.7' \neq 1.5, 3.1 or 4.5</p> <p>CAO</p>

11(a) $8 \times 1172 \div 5$ or 1172×1.6 1875.2 (km)	M1 A1	Do not allow 1172×1.5 Accept 1875 (km) from correct working Answer space takes precedence
11(b) $0.366 \times 1000 \div 60$ 6.1 (m/s)	M1 A1	Accept 6 (m/s) from correct working Answer space takes precedence

<p>13.(a)</p> 	B2	<p>Accept any indication.</p> <p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> • one correct dot with no more than one incorrect dot shown • two correct dots with one incorrect dot shown.
<p>13.(b) $3 \times 5 \times p = 90$ or $90 \div (3 \times 5)$ or equivalent ($p =$) 6</p>	M1 A1	<p>M1 for complete method.</p> <p>Allow M1A1 for a correct embedded answer (e.g. $3 \times 5 \times 6 = 90$), BUT M1A0 if contradicted by $p \neq 6$. Unsupported 6 is awarded M1A1.</p>

15.

(Hours worked on Friday =) 4.5 (hours)

B2

Answer space takes precedence.

Mark final answer.

Accept $4\frac{1}{2}$ (hours).

Award B1 for sight of one of the following:

- Correct time given but not in hours (e.g. 4 hours 30 mins, 270 minutes)
- 9 (hours for M,T,W) from correct working
- method to arrive at hours for full day (e.g. $4x = 36$)
- method to arrive at hours for half day (e.g. $8y = 36$)
- 4.5 seen but then incorrect workings seen (e.g. 4 hours 50 minutes, 4 hours 30).

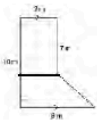
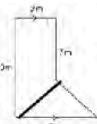
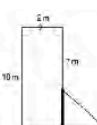
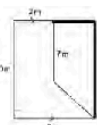
<p>17. (Length of A = $35 \text{ cm} \div 5 \times 2 =$) 14 (cm) (Total length of B and C = $35 - 14 =$) 21 (cm) (Length of B =) $21 \div (1 + 6)$ OR (Length of C =) $21 \div (1 + 6) \times 6$ (Length of B =) 3 (cm) AND (Length of C =) 18 (cm)</p>	<p>B1 B1 M1 A1</p>	<p>Check diagram for answers. Not from incorrect working. FT 35 – ‘their 14’. Not from incorrect working. Strict FT ‘their 21’ (including 35 and 14) $\div 7$ Sight of 3 or 18 implies M. FT ‘their 21’ $\div 7 \times 6$. Penalise -1 only once if their A, B or C labelled incorrectly.</p>
<p><u>17. Alternative method</u> (Total length of B and C = $35 \text{ cm} \div 5 \times 3 =$) 21 (cm) (Length of A = $35 - 21 =$) 14 (cm) (Length of B =) $21 \div (1 + 6)$ OR (Length of C =) $21 \div (1 + 6) \times 6$ (Length of B =) 3 (cm) AND (Length of C =) 18 (cm)</p>	<p>B1 B1 M1 A1</p>	<p>Check diagram for answers. Not from incorrect working. FT 35 – ‘their 21’ Strict FT ‘their 14’ (including 35 and 14) $\div 7$ Sight of 3 or 18 implies M1 FT ‘their 21’ $\div 7 \times 6$. Penalise -1 only once if their A, B or C labelled incorrectly.</p>

Unit 2: Intermediate Tier	Mark	Comments
1.(a) $x = 100$	B1	Mark final answer. Allow B1 for a correct embedded answer BUT B0 if contradicted by $x \neq 100$.
1.(b) $7m = 28$ $m = 4$	B1 B1	FT from $7m = k$. Unsupported answer of 4 is awarded B1B1. $m = \frac{28}{7}$ is awarded B1B0. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction or decimal (e.g. if $7m = 34$, then $m = \frac{34}{7}$ is awarded B0B1, but $m = 34 \div 7$ is awarded B0B0). Allow B1B1 for a correct embedded answer BUT only B1B0 if contradicted by $m \neq 4$.

Unit 1: Foundation Tier	Mark	Comments																																
<p>4(a) Method to compare the same number of toothbrushes, e.g. for 1, 5, 6, 15, 30 or 60 toothbrushes</p> <ul style="list-style-type: none"> • (1) $1(.44 \div 3 \text{ AND } 2(.25 \div 5)$ • (3) $(1(.44 \text{ AND}) 3 \times 2(.25 \div 5)$ • (5) $2 \times 1(.44 - 1(.44 \div 3 \text{ (AND } 2(.25))$ • (5) $5 \times 1(.44 \div 3 \text{ (AND } 2(.25))$ • (6) $2 \times 1(.44 \text{ AND } 2(.25 \div 5 + 2(.25)$ • (15) $5 \times 1(.44 \text{ AND } 3 \times 2(.25)$ • (30) $10 \times 1(.44 \text{ AND } 6 \times 2(.25)$ • (60) $20 \times 1(.44 \text{ AND } 12 \times 2(.25)$ <p>An accurate calculation for a 3 pack OR a 5 pack, e.g. 48(p) or 45(p), (£)7.20 or (£)6.75</p> <p>Cost of same number of toothbrushes for 3 pack AND 5 pack WITH conclusion pack of 5 is better value for money</p>	<p>M1</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="8">In £s:</th> </tr> <tr> <th></th> <th>1</th> <th>3</th> <th>5</th> <th>6</th> <th>15</th> <th>30</th> <th>60</th> </tr> </thead> <tbody> <tr> <td>3pk</td> <td>0.48</td> <td>(1.44)</td> <td>2.40</td> <td>2.88</td> <td>7.20</td> <td>14.40</td> <td>28.80</td> </tr> <tr> <td>5pk</td> <td>0.45</td> <td>1.35</td> <td>(2.25)</td> <td>2.70</td> <td>6.75</td> <td>13.50</td> <td>27.00</td> </tr> </tbody> </table> <p>A1</p> <p>A1</p>	In £s:									1	3	5	6	15	30	60	3pk	0.48	(1.44)	2.40	2.88	7.20	14.40	28.80	5pk	0.45	1.35	(2.25)	2.70	6.75	13.50	27.00	<p>If units are given, they must be correct Ignore any subsequent working, unless it adversely impacts on the conclusion</p>
In £s:																																		
	1	3	5	6	15	30	60																											
3pk	0.48	(1.44)	2.40	2.88	7.20	14.40	28.80																											
5pk	0.45	1.35	(2.25)	2.70	6.75	13.50	27.00																											
<p>4(b) (100 ml for) $93 \times 4 \div 3$ or $93 \div 3 + 93$ or $93 \times 20 \div 15$ or $93 \times 100 \div 75$ or equivalent (£)1.24 or 124(p)</p>	<p>M2</p> <p>A1</p>	<p>M1 for any one of the following:</p> <ul style="list-style-type: none"> • (25 ml for) $93 \div 3$ (= 31p) • (5 ml for) $93 \div 15$ (= 6.2p) • (1 ml for) $93 \div 75$ (= 1.24p) <p>If units are given, they must be correct</p>																																

Unit 1: Intermediate Tier	Mark	Comments
5.(a) A correct explanation given. e.g. '(equal) groups do not reach 20', '12 to 15 and 16 to 19 so no 20', 'to reach 20 the groups are not equal' 'it only goes up to 19' '20 not included'.	E1	Allow any unambiguous explanation. Do not accept: 'because there's only 20 attempts'. Award E1 if incorrect values are given in the table but correct explanation given.
5.(b) (0 to 6) 7 to 13 14 to 20	B1	Answer in table takes precedence.
5.(c)(i) $\frac{17}{100}$ or equivalent ISW	B1	B0 for incorrect notation e.g. '17 in 100', '17 out of 100', '17:100' etc.
5.(c)(ii) A correct explanation given e.g. 'the eleven competitors might have all scored 20', 'only one of them (might have) scored 19', 'we don't know how many competitors scored 19' 'the probability of scoring 18, 19 or 20 is $\frac{11}{100}$ ' 'the 11 could include (the scores of) 18 and 20' 'it doesn't tell you the exact score of all 11'	E1	Allow any unambiguous explanation. E0 for mixing number of competitors and number of points scored. e.g. '11 points were scored for 18, 19, 20' '18, 19 or 20 people could have scored 11'.

Unit 1: Intermediate Tier	Mark	Comments
5(a) $50 \times 3 \times 1.8(0)$ or $50 \times 3 \times 180$ (£) 270 or 27000(p)	M2 A2	M1 for any of the following: <ul style="list-style-type: none"> • 50×3 • $50 \times 1.8(0)$ • 50×180 • $3 \times 1.8(0)$ • 3×180 For A2, if units are given, they must be correct, otherwise A1 for 270p or £27000 Ignoring units, A1 for any of the following: <ul style="list-style-type: none"> • $(50 \times 3 =) \quad 150$ • $(50 \times 1.8(0) =) \quad 90$ • $(50 \times 180 =) \quad 9000$ • $(3 \times 1.8(0) =) \quad 5.4(0)$ • $(3 \times 180 =) \quad 540$
5(b)(i) (Mean of 8 temperatures is $-56 \div 8 =$) -7 (°C)	B3	Must not be from incorrect working, other than allowing from $56 \div 8$ B2 for any one of the following: <ul style="list-style-type: none"> • $-56 \div 8$ • $56 \div 8 = 7$ B1 for any one of the following: <ul style="list-style-type: none"> • (sum of temperatures) -56 • (sum of temperatures) 56 • sight of 'their sum of temperatures' $\div 8$, provided the summation is <u>not</u> from a sum involving all positive integers or all negative integers, with or without a negative sign inserted. If '$\div 8$' is not seen, it may be implied from 'their sum' and 'their mean' (rounded or truncated)
5(b)(ii) $(-56 + -16) \div 9$ or $-72 \div 9$ -8 (°C)	M1 A1	FT 'their -56 ' from (b)(i) On FT allow a rounded or truncated answer Allow a correctly rounded or truncated answer, to 1d.p. for '(their -56 + -16) $\div 9$ ' to imply M1 A1
5(c)(i) $20 \times (8.6 (\pm 0.2))$ $172 (\pm 4 \text{ m})$	M1 A1	Do not award from sight of an incorrect evaluation of 'their 8.6×20 '
5(c)(ii) $232^\circ \pm 2^\circ$	B1	

Unit 1: Intermediate Tier	Mark	Comments																																				
6(a)(i) (£) 70	B2	B1 for any one of the following: <ul style="list-style-type: none"> • use of (£)2010 • use of (£)1940 																																				
6(a)(ii) Answer in the inclusive range (£)1700 to (£)1780	B1	Allow answers given as a range provided 'their range' is inclusively within the required range																																				
<p>6(b) (Total area of the driveway)</p>  <ul style="list-style-type: none"> • $\frac{1}{2} \times (10 - 7) \times (2 + 6) + 2 \times 7$ • $\frac{1}{2} \times 3 \times 8 + 2 \times 7$ (= 12 + 14)  <ul style="list-style-type: none"> • $\frac{1}{2} \times 2 \times (7 + 10) + \frac{1}{2} \times 6 \times (10 - 7)$ • $\frac{1}{2} \times 2 \times 17 + \frac{1}{2} \times 6 \times 3$ (= 17 + 9)  <ul style="list-style-type: none"> • $\frac{1}{2} \times (10 - 7) \times (6 - 2) + 2 \times 7 + 2 \times 3$ • $\frac{1}{2} \times 3 \times 4 + 2 \times 10$ (= 6 + 20)  <ul style="list-style-type: none"> • $6 \times 10 - \frac{1}{2} \times (6 - 2) \times (7 + 10)$ • $6 \times 10 - \frac{1}{2} \times 4 \times 17$ (= 60 - 34) <p style="text-align: right;">26 (m²)</p> <p>Cost in the inclusive range (£)1780 to (£)1860</p>	M2	<p>M1 for one of the following appropriate areas:</p> <ul style="list-style-type: none"> • $\frac{1}{2} \times (10 - 7) \times (2 + 6)$ (= 12m² area of trapezium) • $\frac{1}{2} \times 2 \times (7 + 10)$ (= 17m² area of trapezium) • $\frac{1}{2} \times 6 \times (10 - 7)$ (= 9m² area of a triangle) • $\frac{1}{2} \times (10 - 7) \times (6 - 2)$ (= 6m² area of the triangle) • $\frac{1}{2} \times (6 - 2) \times (7 + 10)$ (= 34m² area 'extra' trapezium) <p>A1 CAO</p> <p>B1 FT '20 ≤ their derived composite area ≤ 30' for a suitable cost from the scatter diagram, within a range (shown below); must be for a composite area</p> <p>Do not FT from the perimeter or with the missing side, 25(m)</p> <p>Allow an answer in a range, provided 'their range of answers' is inclusively within the stated range</p> <p>On FT cost in the inclusive range:</p> <table border="1" data-bbox="853 1377 1396 1724"> <thead> <tr> <th>Area (m²)</th> <th>Least estimated cost (£)</th> <th>Greatest estimated cost (£)</th> </tr> </thead> <tbody> <tr><td>20</td><td>1410</td><td>1460</td></tr> <tr><td>21</td><td>1460</td><td>1510</td></tr> <tr><td>22</td><td>1520</td><td>1570</td></tr> <tr><td>23</td><td>1590</td><td>1650</td></tr> <tr><td>24</td><td>1650</td><td>1710</td></tr> <tr><td>25</td><td>1700</td><td>1780</td></tr> <tr><td>26</td><td>1780</td><td>1860</td></tr> <tr><td>27</td><td>1850</td><td>1930</td></tr> <tr><td>28</td><td>1920</td><td>2010</td></tr> <tr><td>29</td><td>1970</td><td>2060</td></tr> <tr><td>30</td><td>2030</td><td>2130</td></tr> </tbody> </table>	Area (m ²)	Least estimated cost (£)	Greatest estimated cost (£)	20	1410	1460	21	1460	1510	22	1520	1570	23	1590	1650	24	1650	1710	25	1700	1780	26	1780	1860	27	1850	1930	28	1920	2010	29	1970	2060	30	2030	2130
Area (m ²)	Least estimated cost (£)	Greatest estimated cost (£)																																				
20	1410	1460																																				
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28	1920	2010																																				
29	1970	2060																																				
30	2030	2130																																				

Unit 1: Intermediate Tier	Mark	Comments
<p>8. (Probability of winning score =) $\frac{3}{20}$ or equivalent</p>	<p>B2</p>	<p>Award B2 for sight of</p> <ul style="list-style-type: none"> $\frac{1}{4} \times \frac{3}{5}$ '3 winners out of 20' the 3 winning combinations/scores clearly identified in a list/table of the 20 possible combinations/scores. <p>B2 may be implied in later workings. Award B1 for one of the following:</p> <ul style="list-style-type: none"> for convincing identification of the 20 combinations/scores, for example: <ul style="list-style-type: none"> ✓ sight of 20 ✓ 4×5 ✓ showing all 20 correct combinations $10 + 1, 10 + 2 \dots$ with no extras ✓ all 20 correct scores listed with no extras ✓ completed sample space drawn (4 by 5) ✓ sight of $\frac{1}{4}$ AND $\frac{3}{5}$ or equivalent. identifying the three correct possible winning scores (43, 44, 45) with no extras identifying the three correct winning combinations (40 + 3, 40 + 4, 40 + 5) with no extras $\frac{3}{x}$ provided $x > 3$ and correct winning combinations/scores identified $\frac{y}{20}$ provided with $y < 20$ $\frac{3}{20}$ from incorrect winning combinations or scores identified <u>strict FT</u> from 'their list' provided clearly stated $\frac{\text{their number of winning scores}}{\text{their total number of possibles scores}}$
<p>(Number of winners =) $\frac{3}{20} \times 100$ or equivalent</p> <p style="text-align: right;">= 15</p>	<p>M1</p>	<p>Award M1 for $\frac{1}{4} \times \frac{3}{5} \times 100$. May be implied e.g. $100 \div 20 = 5, 5 \times 3 = 15$. FT 'their probability of winning score' $\times 100$, provided 'their probability of winning score' < 1, or $\neq \frac{x}{100}$. M0 awarded if 'their probability of winning score' is simplified incorrectly.</p>
<p>(Profit =) (£)100 – 15 × (£)5 OR (£)85 – 15 × (£)4</p> <p style="text-align: right;">= (£)25</p>	<p>A1</p> <p>M2</p> <p>A1</p>	<p>May be implied by '15 out of 100' or equivalent. If 15 is not seen but final answer of £15 is given (i.e. 'people' confused with 'money') then allow only M1A0. Answer must be whole number.</p> <p>FT 'their number of winners', provided $\neq 3$ and < 100. Award M1 for one of the following:</p> <ul style="list-style-type: none"> $15 \times (£)5$ an appropriate sight of (£)75 'their number of winners' $\times (£)5$ 'their number of winners' $\times (£)5$ evaluated correctly (£)100 – (£)15 AND $15 \times (£)4$ (£)100 – 'their number of winners' $\times (£)1$ AND 'their number of winners' $\times (£)4$. <p>FT provided M2 (not M1M1) previously awarded. An unsupported answer of (£)25 is awarded B2 M1A1M2A1.</p>

8. Alternative method for the final 5 marks

Must clearly be working with groups of 20 throughout

$$20 \times (\text{£})1 - 3 \times (\text{£})5$$

$$(\text{£})5$$

$$\times 5$$

$$=(\text{£})25$$

M2

Method must be seen for M2.
FT 'their 20' $\times (\text{£})1 -$ 'their 3' $\times (\text{£})5$.

A1

May be implied in later working.

m1

FT 100 \div 'their 20'

A1

Unit 1: Intermediate Tier	Mark	Comments
8(a)(i) $200 - 80$ or $90 + 30$ 120 (customers)	M1 A1	
8(a)(ii) 32 seconds	B1	
8(a)(iii) $\frac{200-170}{200}$ or $\frac{30}{200}$ or $\frac{15}{100}$ $\frac{3}{20}$	M1 A1	Award M1 for 0.15 or 15% Only ignore further working if written as 0.15 or 15% If no marks, award SC1 for an answer of $\frac{17}{20}$ (from 40 seconds or less)
8(b)(i) 36	B1	
8(b)(ii) $46 - 20$ 26	M1 A1	Allow $20 - 46$
8(c) 'No' unambiguously stated or implied AND a reason, e.g. 'upper quartile is higher this year' '75% reading higher this year' 'interval was 37 (or 38) to 50 seconds last year, this year it is 46 to 50 seconds'	E1	Do not ignore incorrect values for the upper quartiles given, E0 if 'upper quartile' or '75%' stated with incorrect upper quartile readings Allow 'No' with a reason, e.g. '(last year) 38, (this year) 46' '(last year) 37(...), (this year) 46' Do not accept, e.g. 'range greater this year' 'lower quartile is lower this year' 'median higher this year' 'customers still waiting at 50 seconds'

9.(a) $x = 100$	B1	Mark final answer. Allow B1 for a correct embedded answer BUT B0 if contradicted by $x \neq 100$.
9.(b) $7m = 28$ $m = 4$	B1 B1	FT from $7m = k$. Unsupported answer of 4 is awarded B1B1. $m = \frac{28}{7}$ is awarded B1B0. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction or decimal (e.g. if $7m = 34$, then $m = \frac{34}{7}$ is awarded B0B1, but $m = 34 \div 7$ is awarded B0B0). Allow B1B1 for a correct embedded answer BUT only B1B0 if contradicted by $m \neq 4$.

Unit 1: Foundation Tier	Mark	Comments
9(a) $50 \times 3 \times 1.8(0)$ or $50 \times 3 \times 180$ (£) 270 or 27000(p)	M2 A2	M1 for any of the following: <ul style="list-style-type: none"> • 50×3 • $50 \times 1.8(0)$ • 50×180 • $3 \times 1.8(0)$ • 3×180 For A2, if units are given, they must be correct, otherwise A1 for 270p or £27000 Ignoring units, A1 for any of the following: <ul style="list-style-type: none"> • $(50 \times 3 =) \quad 150$ • $(50 \times 1.8(0) =) \quad 90$ • $(50 \times 180 =) \quad 9000$ • $(3 \times 1.8(0) =) \quad 5.4(0)$ • $(3 \times 180 =) \quad 540$
9(b)(i) (Mean of 8 temperatures is $-56 \div 8 = -7$ (°C)	B3	Must not be from incorrect working, other than allowing from $56 \div 8$ B2 for any one of the following: <ul style="list-style-type: none"> • $-56 \div 8$ • $56 \div 8 = 7$ B1 for any one of the following: <ul style="list-style-type: none"> • (sum of temperatures) -56 • (sum of temperatures) 56 • sight of 'their sum of temperatures' $\div 8$, provided the summation is <u>not</u> from a sum involving all positive integers or all negative integers, with or without a negative sign inserted. If '$\div 8$' is not seen, it may be implied from 'their sum' and 'their mean' (rounded or truncated)
9(b)(ii) $(-56 + -16) \div 9$ or $-72 \div 9$ -8 (°C)	M1 A1	FT 'their -56' from (b)(i) On FT allow a rounded or truncated answer Allow a correctly rounded or truncated answer, to 1d.p. for '(their -56' + -16) $\div 9$ to imply M1 A1
9(c)(i) $20 \times (8.6 (\pm 0.2))$ 172 (± 4 m)	M1 A1	Do not award from sight of an incorrect evaluation of 'their 8.6×20 '
9(c)(ii) $232^\circ \pm 2^\circ$	B1	

17.(b)	$(£)48 \div 8$ or $(£)6$	M1	Sight of an appropriate 6 (or 42) implies M1.
	$(£)6$ AND $(£)42$ ISW	A1	Allow in any order. Allow $(£)6 : (£)42$ or $(£)42 : (£)6$.

2.

$30 \times 8000 =$	240 000
$30 \times 7900 =$	237 000
$30 \times 7940 =$	238 200
$33 \times 8000 =$	264 000
$35 \times 8000 =$	280 000

M1 Award M1 for any one of the products shown in the table.

A1 Award A1 for the corresponding approximation.
ISW
Unsupported answers will get MOAO.

An answer of 262 020 or 262 020 approximated is awarded MOAO.

If no marks, award SC1 for one of the following as a final answer:

- $3 \times 8 = 240\,000$
- $3 \times 79 = 237\,000$
- $3 \times 794 = 238\,200$
- $33 \times 8 = 264\,000$
- $35 \times 8 = 280\,000$.

<p>8(a)(i) (Calories in cake(s)) $84 \times 600 \div 100$ ($\div 4$) OR (Mass per cake) $84 \div 4$ ($= 21$)g <u>AND</u> (Calories per 1g of cake) $600 \div 100$ ($= 6$ calories) (Calories in 1 cake 21×6 $=$) 126 (calories) (% of required calories) $\frac{126}{2400}$ ($\times 100$) or 0.0525 ($\times 100$) or $\frac{5.25}{100}$ 5.25(%)</p>	<p>M1 A2 M1 A1</p>	<p>A1 for any one of the following: <ul style="list-style-type: none"> (calories in 4 cakes 84×6 $=$) 504 (calories) an answer from premature approximation of $100 \div 21$ in the range 4.76 to 4.8 giving an answer in the range 125 to 126.050..(calories) M1 FT 'their derived calories' provided <ul style="list-style-type: none"> calories information was used in 'their calculation of calories, and 'their derived calories' $\neq 600$ e.g. 600 calories (in 100 g), or 6 calories (in 1 g), or similar used in a calculation to derive a number of calories A1 ISW further rounding or truncation Allow 5(%), 5.2(%) or 5.3(%) from correct working If no marks, award SC1 for $(600 \times 84 \div 4 =)$ 12 600</p>
<p>8(a)(i) <u>Alternative method only when working is seen as a single calculation</u> $\frac{600}{2400} \times \frac{84}{100} \times \frac{1}{4}$ ($\times 100$) or equivalent Two correct stages of simplifying or calculation 5.25 (%)</p>	<p>M3 A1 A1</p>	<p>M2 for $\frac{600}{2400} \times \frac{84}{100}$ ($\times 100$) or equivalent FT from M2 FT from M2 for an answer of 21(%)</p>
<p>8(a)(ii) $84 \times 515 \div (1360 + 2725 + 515 + 4)$ or $84 \times 515 \div 4604$ 9.4 (g)</p>	<p>M1 A2</p>	<p>A1 for 9.3(96... g) not from premature approximation or $\frac{10815}{1151}$ or 9.40 (g)</p>
<p>8(b)(i) $143 \div 2.2$ 65 (kg)</p>	<p>M1 A1</p>	<p>Answer space takes precedence Accept use of $143 \div 2.205 = 64.85...$ (kg) as a more accurate conversion</p>

<p>8(b)(ii) Any one of the following complete methods for the number of minutes to burn off energy in 1 banana:</p> <ul style="list-style-type: none"> • $92 \div (690 \div 60)$ • $60 \times (92 \div 690)$ • $60 \div (690 \div 92)$ <p style="text-align: right;">8 (minutes)</p>	<p>M2</p> <p>A1</p>	<p>May be seen in stages</p> <p>M1 for any one of the following:</p> <ul style="list-style-type: none"> • $690 \div 60$ (= 11.5) • $92 \div 690$ ($= \frac{2}{15} = 0.1333\dots$) • $690 \div 92$ (= 7.5) <p>CAO. Answer space takes precedence</p>
<p>8(b)(iii) $9 \times 38 \div 60$</p> <p style="text-align: right;">5.7 (km)</p>	<p>M2</p> <p>A1</p>	<p>M1 for sight of any one of the following:</p> <ul style="list-style-type: none"> • 9×38 (= 342) • $38 \div 60$ (= 0.6333....) • $9 \div 60$ (= 0.15) <p>CAO, allow 5700m Answer space takes precedence Do not accept 5700 (km) in the answer space</p>

11(a) 76 (g)	B1	Answer space takes precedence
11(b) $3 \times 400 \times 25 \div 100$ or $\frac{3}{4} \times 400$ or equivalent 300 (little gulls)	M1 A1	If no marks, award SC1 for $(\frac{1}{4} \times 400 =) 100$ (gulls)
11(c) 25(%)	B1	Answer space takes precedence
11(d)(i) Slender(-billed gulls)	B1	
11(d)(ii) Lower quartile	B1	<u>Strictly depends on B1 previously awarded in (d)(i)</u>

13.(a) 89.06 or $\frac{4453}{50}$	B2	B1 for sight of any of the following: <ul style="list-style-type: none">• $89(\cdot 0)$• 89.1• 89.06%• 8.33• $80.73.$
13.(b) $\frac{19.44}{36}$ ($\times 100$) or equivalent $54(\%)$	M1 A1	Allow 0.54 or $\frac{27}{50}$ for M1.

14. **Complete method to find the volume**

For example:

Square and rectangle (allow any equivalent valid method)

- $2 \times (12 \times 12 + 5 \times (16 - 12))$
- $2 \times (12 \times 12 + 5 \times 4)$
- $2 \times (144 + 20)$
- $288 + 40$
- 2×164

Two rectangles (allow any equivalent valid method)

- $2 \times (5 \times 16 + 12 \times (12 - 5))$
- $2 \times (5 \times 16 + 12 \times 7)$
- $2 \times (80 + 84)$
- $160 + 168$
- 2×164

Three rectangles (allow any equivalent valid method)

- $2 \times (12 \times (12 - 5) + 5 \times 12 + 5 \times 4)$
- $2 \times (12 \times 7 + 5 \times 12 + 5 \times 4)$
- $2 \times (84 + 60 + 20)$
- $168 + 120 + 40$
- 2×164

Larger rectangle – smaller rectangle (allow any equivalent valid method)

- $2 \times (16 \times 12 - (16 - 12) \times (12 - 5))$
- $2 \times (16 \times 12 - 4 \times 7)$
- $2 \times (192 - 28)$
- 2×164
- $384 - 56$

(Volume =) 328 cm^3

M3

Note: check diagram for the area and missing lengths
If not M3 award M2 or M1 depending on the entries in the table.

Calculations such as $12 \times 12 \times 5 \times 16 \times 2$ are awarded M0.

For M2 and M1, FT 'their (16 - 12)' or 'their (12 - 5)' where appropriate.

Award M2 for one of the following: <i>(summing two areas/subtracting two areas/finding one volume)</i>	Award M1 for one of the following: <i>(calculating one area)</i>
Square and rectangle	
<ul style="list-style-type: none"> • $12 \times 12 + 5 \times (16 - 12)$ • $12 \times 12 + 5 \times 4$ • $144 + 20$ • 164 • $2 \times 12 \times 12$ • 2×144 • 288 • $2 \times 5 \times (16 - 12)$ • $2 \times 5 \times 4$ • 2×20 • 40 	<ul style="list-style-type: none"> • 12×12 • 144 • $5 \times (16 - 12)$ • 5×4 • 20
Two rectangles	
<ul style="list-style-type: none"> • $5 \times 16 + 12 \times (12 - 5)$ • $5 \times 16 + 12 \times 7$ • $80 + 84$ • 164 • $2 \times (5 \times 16)$ • 2×80 • 160 • $2 \times 12 \times (12 - 5)$ • $2 \times 12 \times 7$ • 2×84 • 168 	<ul style="list-style-type: none"> • 5×16 • 80 • • $12 \times (12 - 5)$ • 12×7 • 84
Three rectangles	
<ul style="list-style-type: none"> • $12 \times (12 - 5) + 5 \times 12 + 5 \times 4$ • $12 \times 7 + 5 \times 12 + 5 \times 4$ • $84 + 60 + 20$ • 164 • $2 \times 12 \times (12 - 5)$ • $2 \times 12 \times 7$ • 2×84 • 168 • $2 \times 5 \times 12$ • 2×60 • 120 • $2 \times 5 \times 4$ • 2×20 • 40 	<ul style="list-style-type: none"> • $12 \times (12 - 5)$ • 12×7 • 84 • 5×12 • 60 • 5×4 • 20
Larger rectangle – smaller rectangle	
<ul style="list-style-type: none"> • $16 \times 12 - (16 - 12) \times (12 - 5)$ • $16 \times 12 - 4 \times 7$ • $192 - 28$ • 164 • $2 \times 16 \times 12$ • 2×192 • 384 • $2 \times (16 - 12) \times (12 - 5)$ • $2 \times 4 \times 7$ • 2×28 • 56 	<ul style="list-style-type: none"> • 16×12 • 192 • $(16 - 12) \times (12 - 5)$ • 4×7 • 28

A1

CAO

<p>15.</p> <p>Correct bisector of 60°</p> <p>Arc of radius 5 cm, centre B.</p> <p>Correct region identified.</p>	<p>B2</p> <p>B1</p> <p>B1</p>	<p>Allow a tolerance of $\pm 2^\circ$ and $\pm 2\text{mm}$. The construction need not be below the line for the B2 and the first B1 (but the final B1 won't be awarded).</p> <p>Allow at A or B. Correct construction arcs (initial and secondary) must be seen or an alternative valid method. The angle must be formed for the bisector and the line must reach the intersection of the arcs.</p> <p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> • correct construction of 60° at A or B. The initial and secondary construction arcs must be seen but line forming the angle may not need to be seen (depending on method) • correct bisector of 'their acute angle' at A or B. The initial and secondary construction arcs and bisector line must be seen and reach the intersection of the arcs. <p>For B1, the arc must be of sufficient length so as not to be considered a 'point' or a 'notch' i.e. for a sector of at least 10° at B.</p> <p>For this B1, the region must be:</p> <ul style="list-style-type: none"> • in the correct location at B • below the line • include an angle • include an arc. <p>FT if at least B1 previously awarded.</p>
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