MARK SCHEME

Question			Answer	Marks	Part marks and guidance	
1	a		[Rowan Frequency] 6 [Other Tally] 𝍸 𝍸 I I I	2	**B1** for each	
	b		All heights correct and all bars correctly placed	2FT	**FT** *their* Rowan frequency **B1** for two correct heights or all heights correct with unequal widths	Correct heights are 15, 18, 6, 13 Tolerance on Oak and Rowan ±1mm by eye Tolerance for Beech and Other closer to middle of rectangle than the top or bottom Allow good freehand if within tolerance
	c		30	2	**M1** for 18/60 **oe**	
2	a	i	7 ¼ oe	1		Accept eg $\frac{58}{8}$ ISW Do not accept eg $6\frac{5}{4}$
		ii	36	2	**M1** for 63 ÷ 7 **soi**	Implied by [$\frac{1}{7}$ of 63] = 9 $\frac{63}{7}$ not enough for M1 without 9 or division sign or bus stop eg $7\overline{)63}$

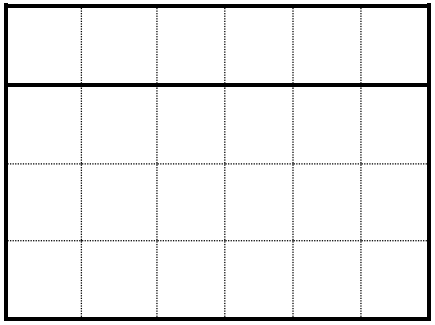
Question			Answer	Marks	Part marks and guidance	
	b		[$\frac{4}{5}$=] $\frac{36}{45}$ **and** [$\frac{7}{9}$=] $\frac{35}{45}$ **oe** or [$\frac{4}{5}$=] 0.8 **and** [$\frac{7}{9}$=] 0.77… or 0.78	**2**	**M1** for correct equivalent fraction or decimal to $\frac{4}{5}$ or $\frac{7}{9}$ **ISW** **Or M1** for finding $\frac{4}{5}$ **and** $\frac{7}{9}$ of a common multiple of 5 and 9	Accept any valid complete comparison Condone equivalent percentage. Accept $0.\dot{7}$
	c		Any **fraction** *n* st 0.2 < *n* < 0.25 such as $\frac{9}{40}$	**2**	**M1** for either a fraction equivalent to 0.2 **and** a fraction equivalent to 0.25 **seen**, where the denominators o**r** the numerators are the same e.g. $\frac{8}{40}$ **and** $\frac{10}{40}$ **seen** or [$\frac{1}{5}$=] 0.2 **and** [$\frac{1}{4}$=] 0.25 **seen** or *n* st 0.2< *n* < 0.25 where *n* not a fraction	Accept equivalent percentages Eg $\frac{4.5}{20}$
3	**a**		When multiplying [12.4] by 10, Nathan has not moved the figures to the left [he has just added a 0]	**1**	Accept 12.4 × 10 = 124 not 12.40	Condone he has not moved the decimal point to the right soi Accept reference to either first or second line of working **See Appendix B**
			285.2	**2**	**M1** for 12.4 × 20 = 248 or 124 x 2 = 248	Accept 248 seen If 12.4 × 23 is worked out using grid method, allow M1 if no more than one error. If other long multiplication method used, allow M1 if not more than one arithmetic slip but M0 if error in place value

Question			Answer	Marks	Part marks and guidance	
	b		8.60	**3**	**M2** for 6.45 × 4 ÷ 3 **oe** Or **M1** for 6.45 × 4 **oe** or 25.8[0] **seen**	
4	**a**	**i**	3.2	**2**	Accept 3.1 to 3.3 **M1** for 6.2 to 6.6 [cm] **seen** or 62 to 66 [mm] **seen**	May be seen on diagram or on the answer line
		ii	115	**1**	Accept 113 to 117	
	b		C marked 5 cm from B C marked on bearing of 230° from B	**2**	Accept 4.8 to 5.2 cm Accept 226° to 234° **B1** for one correct	Condone C not labelled if clear indication is given eg marked with a cross If C not indicated, an arc radius 5cm, centre B scores B1 with no other arcs Use overlay as a guide for 2 marks or use on screen ruler and protractor to confirm B1. Protractor reading 126° to 134°
5	**a**		$3x^2 + 6xy$ final answer	**2**	**B1** for $3x^2$ or $6xy$ **seen**	Condone $6yx$ Do not accept eg 6 × x × y
	b	**i**	4	**1**		
		ii	33	**2**	**M1** for $\frac{x}{3} = 9 + 2$ or better **or** **M1** for $x = a \times b$ following $\frac{x}{b} = a$	Alternative method **M1** for $x - 6 = 27$ **or** **M1** for $x = a + b$ following $x - a = b$
6	**a**		Corresponding	**1**		Do not accept F angles

Question			Answer	Marks	Part marks and guidance	
	b		Angle BXC = 50 [Angles in a] isosceles [triangle] Angles in a triangle add up to 180	**2** **1** **1**	**B1** for Angle XCB = 65 Accept Alternate angles [are equal] **and** Angles on a [straight] line =180	XCB may be seen on the diagram Accept C for XCB, X for BXC Condone isos for isosceles [Angles in a] isosceles triangle add up to 180 scores final 2 marks Key words for 1 mark in 'Angles in a triangle add up to 180' are 'triangle' and '180'
7			**For candidates who have not added the erratum "The coin is put back" to their script you must use mark scheme in APPENDIX A** [1p] 6 [2p] 8 [5p] 5 and [10p] 1	 **1** **1** **2**	 **M1** for 5p and 10p coins total value being 35p **soi** or 57 – *their 6* x 1 – *their 8* x 2 Or Following 0 marks **SC1** for a total of 20 coins or a total of 57p	 eg M1 implied by [5p] 1 and [10p] 3 from values given in the answer spaces
8	**a**	**i**	11	**1**		Accept -11, ±11
		ii	$\frac{1}{16}$	**1**		Accept 0.0625

Question			Answer	Marks	Part marks and guidance	
	b		9	**2**	**M1** for $(9 – 6)^2$ or better **Or** **SC1** for answer of 144	
	c		5^3 = 125	**1**		
9	**a**		12	**3**	**M2** for 420 ÷ 7 ÷ 5 or 420 ÷ 35 Or **M1** for 420 ÷ 7 **soi** or 420 ÷ 5 **soi**	Condone 12.0, 12.00
	b	**i**	20% is one day **oe**	**1**	Or 20% = 1/5	**See Appendix B**
		ii	336	**2**	**M1** for 420 × 0.8 **oe** or 420 – 84 or *their 12* x 7 x 4 **oe**	
10	**a**	**i**	4 – *n* final answer	**1**		Accept eg 4 – *x* Ignore *C* = or *w* = etc Ignore any units given in all parts
		ii	2*n* final answer	**1**		Accept *n*2, 2 x *n*, *n* x 2 Condone 4(4 – *n*) Ignore *A* = etc

Question			Answer	Marks	Part marks and guidance	
	b		$\frac{16}{6}$ or $\frac{8}{3}$ or $2\frac{4}{6}$ or $2\frac{2}{3}$ or 2.6[6…] or 2.7	**3**	**M1** for 4(4 – *n*) **oe** or 4 × 4 ÷ 3 or better And **M1** for *their* 4(4 – *n*) = 2*n* or better or $2n = \frac{16}{3}$ **oe** or $4(4 - n) = \frac{16}{3}$ **oe**	**Isw** Accept eg $5\frac{1}{3}$ or 5.33[…] for $\frac{16}{3}$ M1M1 implied by eg 5.33 ÷ 2
11	**a**		18, 29	**1**		Ignore subsequent terms
	b		7	**2**	**M1** for the term before 31 is 19 **soi**	Condone 7, 12, 19,... for 2 marks. M0 if a 19 is **just** seen as the difference
	c		First term is $y - x$ Fourth term is $x + y$ Fifth term is $y + x + y$ or $2y + x$ oe	**1** **1** **1FT**	 **FT** *their Fourth term* + y	Condone their correct expressions equated to different variables eg $2y + x = n$ etc *Their Fourth term* an expression in *x* and/or *y*
12	**a**		Valid reason	**1**	Such as ‘to make it easier to work out the area’	**See Appendix B**

Question			Answer	Marks	Part marks and guidance	
	b		19 000 or 19 200	5	**M2** for 150 × (180 + 220) ÷2 **soi** **Or** **M1** attempt at an area **And** **M1** attempt to convert *their area* to hectares **soi** **And** **M1** for 6400 × *their area*	Mark answer line first, award 5 for a correct answer. If incorrect, then award M marks for correct steps **seen** Area of trapezium 30000 Such as 180 x 150 or 220 x 150 Eg *their* area ÷ 10000 oe *Their area* in m^2 or hectares eg 180 x 150 x 6400 or 6400 x 30000 or eg 6400 x 3 For the final 2 marks their area may have come from an attempt at perimeter, volume, etc
13	a			2	**B1** for rectangle 6cm by 4cm	Accept clear intention Accept any orientation Use overlay For B1 ignore any **internal** lines within a rectangle 6cm by 4cm

Question			Answer	Marks	Part marks and guidance	
	b		54	3	**B1** for 9 [cm^2] **And** **M1** for *their* 9 × 6 or for a volume calculation where 6 is identified as the length	seen as area Eg *b* x *l* x *w* = 4 x 6 x 3 May be seen on diagram
14			$\frac{1}{11}$ final answer	2	**M1** for $\frac{30}{330}$ oe or correct cancelling shown After 0 scored, **SC1** for their fraction written in simplest form	For M1, condone 1 correct stage of cancelling common factors in numerators and denominators SC1 dep on a fraction that reduces
15			64	3	**M2** for 160 ÷ 2.5 **oe isw** Or **M1** for 160 and 2.5 **oe seen** or for attempt at 160 divided by *their* time interval **isw** Or for clear attempt to find gradient of line joining (0900, 0) to (1130, 160) or *their* dist divided by 2.5 **oe isw**	For M1, *their* time interval is in range 2 to 3 or 2h 30m or 1.5 or 3.5, accept 150 mins used

Question			Answer	Marks	Part marks and guidance	
16			A - Yes with appropriate reasoning involving rounding and correct simplification to 3 : 8 or 3 :11 or 8 : 11 or ratios reversed OR B - Yes it is approximately correct oe and simplification of 6400 : 16200 to 32 : 81 OR C - Yes with a correctly evaluated calculation using e.g. ratio 3 : 8 with a comparison comment OR D - Yes and e.g. 16200 ÷ 8 **and** 6400 ÷ 3 correctly evaluated	**3**	**M2** eg for showing 6000 : 16000 and reducing to 3 : 8 or for appropriate rounding at some stage in correctly simplifying ratio leading to 3 : 8 **isw** or reduces 6400 : 16200 to 32 : 81 **isw** or reduces 6400 : 22600 to 32 : 113 **isw** or for ratio calculation leading to one of the following values seen 6075, 6163 to 6165, 16436 to16440, 17066 to 17067 or 22 275 or 23 463 to 23 467 seen **isw** or for 2025 **and** 2133 to 2134 seen **isw** or 2025 **and** 2054 to 2055 seen **isw** or 2133 to 2134 **and** 2054 to 2055 **seen isw** Or **M1** for 6000 or 16 000 or 20 000 or 22 000 or 23 000 **seen** or for appropriate rounding of one number at some stage in simplifying ratio or for intention to find $\frac{3}{8}$ of 16 200 or for $\frac{8}{3}$ of 6400 or $\frac{3}{11}$ of (16 200 + 6400) or $\frac{8}{11}$ of (16 200 + 6400) **isw** or for 6400 ÷ 3 **and** one of 16 200 ÷ 8 or (6400 + 16 200) ÷ 11 seen **isw** or 16 200 ÷ 8 **and** (6400 + 16 200)÷ 11 seen **isw**	For all marks accept method with equivalent fractions or decimals [3sf or better] Allow equivalent methods working with the totals e.g. 3 : 11, condone 22600 rounded to 22000 For 3 or M2, allow clear 'reverse' methods working from e.g. 3 : 8 to 6000 and 16000 Accept clear working if not in ratio form e.g. 3.2 and 8.1 shown not in ratio The figures in the part marks column are guidance on accuracy required for 3 marks or M2 **SEE APPENDIX B**

Question			Answer	Marks	Part marks and guidance	
17	(a)		$\frac{y+3}{7}$ or $\frac{-y-3}{-7}$ final answer	2	**M1** for $y + 3 = 7x$ or $\frac{y}{7} = x - \frac{3}{7}$ Or for correct FT completion to answer after incorrect first step has been shown	For M1, accept the 'negative terms' versions
	(b)	(i)	$x(x – y)$ final answer	1		Condone omission of final bracket Condone [1]x([1]x – [1]y)
		(ii)	$(x + 6)(x + 2)$ final answer	2	**M1** for $(x + a)(x + b)$ where $ab = \pm 12$ or $a + b = \pm 8$ or for $x(x + 6) + 2(x + 6)$ seen or $x(x + 2) + 6(x + 2)$ seen	a, b integers For 2 marks, condone solutions after correct factors For 2 marks or M1, condone omission of final bracket
18			69, 76, 76, 79	4	In any order **B3** for 4 values with a mode of 76 and a range of 10 OR **B1** for the sum of the 4 values is 300 soi **B1** for at least 2 values with a mode of 76 **B1** for a range of 10 for their given values	Mark final answer in working if answer line blank Integers only for all B marks Condone if 300 shown in working and then *their* final values do not sum to 300 May be from 2, 3 or 4 values on answer line May be from 2, 3 or 4 values on answer line
19	(a)		22 : 15	2	**M1** for any equivalent ratio or for two correct ratios with a common number of children seen implied by $22k$ and $15k$ seen ($k > 1$ and an integer) Or for $\frac{11}{3} : \frac{5}{2}$ or for 11 : 7.5	15k : 22k implies M1 Accept 3.66 to 3.67 : 2.5

Question			Answer	Marks	Part marks and guidance	
	(b)		258	3	**M2** for $\frac{36}{2} \times 5 + \frac{36}{3} \times 11$ [+36] **oe** or ((2 × 11) + (3 × 5)) × 36 ÷ 6 [+36] **oe** or $\frac{6}{6+15+22} \times x = 36$ **oe** or **M1** for $\frac{36}{2} \times 5$ or $\frac{36}{2} \times 7$ **soi** or $\frac{36}{3} \times 11$ or $\frac{36}{3} \times 14$ **soi oe**	M2 implied by 222 [+36] not spoiled 90 + 132 [+ 36] Implied by 90 or 126 or 132 or 168 seen
20			160 and assumed that sample of 50 is representative oe	3	**B2** for 160 or **M1** for $\frac{8}{50} \times 1000$ **oe** **AND** **B1** for assumed that sample of 50 is representative **oe**	Accept: Representative, not biased, random Ignore extra comments after correct comment given **SEE APPENDIX B**
21	**(a)**		$13^2 - 12^2$ or 169 - 144 $\sqrt{13^2 - 12^2}$ **soi** Two shortest sides in both triangles are 5 [cm] and 12 [cm]	**M1** **M1 dep** **A1**	Or $5^2 + 12^2$ or 25 + 144 or $\sqrt{5^2 + 12^2}$ **soi** or 5[cm] side clearly labelled on triangle P **and** 13[cm] clearly labelled on triangle Q	5^2+12^2 seen with 13^2+12^2 scores M0 May be seen in stages eg 5 x 5 =25 12 x 12 = 144 25 + 144 = For second M1 must see √ symbol $\sqrt{13^2 + 12^2}$ scores M0

Question			Answer	Marks	Part marks and guidance	
	(b)		[All] the sides are the same length	1	Accept SAS **or** RHS **or** SSS **soi**	**See Appendix B**