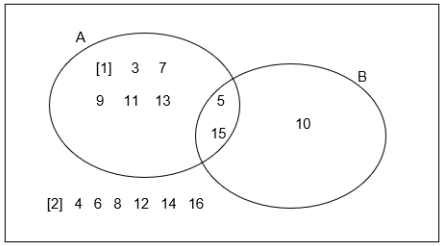
Question			Answer	Marks	Part marks and guidance	
1	(a)	(i)	10	1		
		(ii)	7	1		
	(b)		RomCom	1		
	(c)		20	2	**M1** for 3 [+] 2 [+] 5 [+] 7[+] 3 seen	May be on graph
	(d)		4 : 5	3	**B1** for 25 or (45 – *their* 20) **M1** for *their* 20 : *their* 25 OR **M2** for $\frac{4}{9}:\frac{5}{9}$ seen or **M1** for $\frac{20}{45}:\frac{25}{45}$ oe seen If 0 scored, SC1 for answer 5 : 4	*Their* Yr 10 from (c) *Their* 25 is any value from 12 to 44 May be on answer line For M1 ratio must be seen and not implied from a "simplified" version 20 : 25 implies B1 M1 25 : 20 implies B1 oe 0.444[...] : (0.555 to 0.556)
2	(a)		43	1		
	(b)		1024	1		

Question			Answer	Marks	Part marks and guidance	
3			49.50 with correct working	6	**B5** for figs 495 as final answer with at least the M2 mark OR **M1** for [10p =] 0.2 × 150 oe soi 30 **M1** for [20p =] 0.3 × 150 oe soi 45 and **M1** for (150 – *their* 30 – *their* 45) oe soi by 75 and **M2** for (*their* 30 × 10) and (*their* 45 × 20) and (*their* 75 × 50) oe or **M1** for one from (*their* 30 × 10) or (*their* 45 × 20) or (*their* 75 × 50) oe If 0 or 1 scored and no/insufficient working seen **SC2** for figs 495 as final answer	 Ignore money notation Ignore money notation May be 150 ÷ 2 May work in £ Implied by 300, 900, 3750 or £3, £9, £37.5[0] If M1 only and SC2 available award SC2 only

Question			Answer	Marks	Part marks and guidance	
4	(a)		$\frac{90}{360}$ oe fraction	1		Expect $\frac{1}{4}$ but ignore attempts to cancel initially correct fraction but not convert to decimal or percentage Answer 0.25 after $\frac{1}{4}$ seen scores 0
	(b)		Yes oe and [in 2020] they won more matches (or double the number of matches) than [in 2019] oe or The win fraction went up to ½ oe [from ¼ oe] The win fraction got bigger	1		See appendix Must be clear reference to win not "it" Do not allow comparing with unlike (e.g. W and L) only unless clearly indicating that W replaced L as majority" oe ½ or ¼ may be degrees Allow error in 2020 win fraction Must be an implied comparison
5			702	3	**M2** for 600 × 1.17 oe or **M1** for 600 × [0].17 oe soi by 102	May be 600 + *their* 102 from valid attempt at 17% May be Non-Calculator eg [10% =] 60, [5% =] 30, [1% =] 6, [2%] = 12 and sum of *their* 60, 30 and 12 Must have labels or correct processes
6	(a)		60, 120, 60, 120	1		Accept in any order or only on diagram Must be 120 and not 60|60 or 60+60
	(b)		30, 120, 30	2	**M1** for diagram with longer diagonal drawn only	May be on original drawing If diagram redrawn then diagonal must join "other two" vertices
7			3	2	**M1** for 6 ÷ 2 oe	

Question			Answer	Marks	Part marks and guidance	
8			$4t + 2u$ final answer	2	**B1** for $4t$ or $2u$ seen	
9	(a)			3	**B2** for one element misplaced or repeated or missing or **B1** for one correct region	Condone 1 and/or 2 repeated
	(b)		[Venn diagram] 2 and [because] odd numbers cannot be multiples of 2 oe and no contradictions	2	**B1** for choice of diagram 2	Must justify using properties of elements. Accept "Odd numbers cannot be even" and "All multiples of 2 are even"
10			162	4	**B1** for [Area of face =] 9 **B1** for [Total number of faces =] 18 **M1** for *their* number of faces × *their* 9 Alternative **B1** for [area of face=] 9 **B1** for [total surface area of cube=] 54 **M1** for *their* 54 × 4 – 6 × *their* 9 oe Alternative **B1** for [area of face=] 9 **M1** for 24 × *their* 9 soi 216 **M1** for *their* 216 – 6 × *their* 9	e.g. 4+4+3+3+2+2 or 5+4+4+5 May be in stages e.g. 5×9+4×9+ etc Accept other alternative methods

Question			Answer	Marks	Part marks and guidance	
11	(a)		$a + 2b$ cao	1		Do not accept extras
	(b)		$2y < x$ cao	1		Do not accept extras
	(c)		$2x = 5$ cao	1		Do not accept extras
12			$w = \frac{P - 2h}{2}$ oe	2	**M1** for $\frac{P - 2h}{2}$ oe or correct first step eg $P - 2h = 2w$ or $\frac{P}{2} = \frac{2w}{2} + \frac{2h}{2}$ or for next correct step towards isolating w following first error	Note $w = \frac{2h - P}{-2}$ oe is correct May be $\frac{P}{2} = w + h$ e.g. Following $2w = P + 2h$ w = $\frac{P + 2h}{2}$
13			40 with correct working	5	**B1** for 2800 [cm] or [0].6[0] [m] **M1** for $\frac{\text{figs } 28}{\text{figs } 6}$ soi 46.6 to 46.7 or $46\frac{40}{60}$ oe **M1** for *their* 46.6… truncated soi 46 **M1** for figs 28 – *their* 46 × figs 6 If 0 scored with no/ insufficient working **SC2** for answer 40 or **SC1** for answer 0.4	If both seen and one incorrect award B0 Correct working requires all part marks soi At least 4 repeated additions or repeated subtraction May have indication of continuing 46 implies M2 B1 2800 – 2760 implies M3 B1 May be (*their* 46.6... – 46) × 60

Question			Answer	Marks	Part marks and guidance	
14	**(a)**		5120	**1**		
	(b)		Topozero, Tana, Mweru, Ladoga, Victoria or 986, 3200, 5120, 18 100, 68 900 oe in standard form	**2**	**B1** for Topozero as smallest or Victoria as largest or all in correct reverse order	9.86×10^2, 3.20×10^3, 5.12×10^3, 1.81×10^4, 6.89×10^4 condoning superfluous zeros and slip in index
	(c)		1.5×10^4 nfww isw	**4**	**B3** for 15 000 oe or $1.49[0..] \times 10^4$ or **B2** for 14 900 oe or **M1** for figs 181 – figs 32 If 0 scored **SC1** for *their* value correctly rounded to 2 significant figures	e.g. 15 000 may be 15×10^3 Subtraction may be implied e.g. by figs 15 or figs 149 *Their* unrounded value must be seen
15	**(a)**		285	**2**	**M1** for $\frac{760}{(2+3+3)}$ soi 95	
	(b)		24	**2**	**M1** for $\frac{2}{3} \times 36$ oe	Allow (0.66 or 0.7) $\times$ 36 for M1 only

Question			Answer	Marks	Part marks and guidance	
16	(a)		Triangle at (-8, 6), (-8, 2), (0, 6)	2	**B1** for reflection in $x = k$ or in $y = 0$	Mark intention, condone freehand
	(b)		Enlargement $\frac{1}{4}$ or 0.25 (0, -6)	3	**B1** for each element	Marks spoilt if extra transformations Condone omission of brackets Accept centre as a vector $\begin{pmatrix} 0 \\ -6 \end{pmatrix}$
17	(a)		0.14, 0.09, (0.19), 0.2[0], 0.13, 0.25	2	**B1** for three or four correct relative frequencies in the correct place	Accept fractions
	(b)	(i)	[Unbiased dice] would have each [rf =] 0.16-0.17 or [Unbiased dice] would have each [f =] 50 or comment about very unequal [relative] frequencies and implied comparison	1		Accept "about 0.16" Accept "about 50" Not enough to say one number was rolled the most. Must say 6 [and 4] or some numbers are much higher or 2 or 5 or some numbers are much lower
		(ii)	need larger sample oe	1		
18	(a)		3.39 and 3.44 only	2	**B1** for one only or for two correct and one extra	
	(b)	(i)	10 cm [between 3.35 and 3.45] oe or [If to nearest cm it should be between] 3.395 and 3.405	1		Mention of 10 cm (range or difference) oe
		(ii)	3.405	1		

19	**(a)**		4 with correct working	**3**	**M1** for 210 – *n* where 40 ≤ *n* ≤ 50 soi by 160 to 170 **M1** for (*their* number of characters) ÷ 40 Alternative **M2** for two from [4 letters] 210 ÷ 5 [5 letters] 210 ÷ 6 [6 letters] 210 ÷ 7 or **M1** for one from [4 letters] 210 ÷ 5 [5 letters] 210 ÷ 6 [6 letters] 210 ÷ 7 Alternative (trials): **M2** for two from 3 × 40 + [40 to 50] 4 × 40 + [40 to 50] 5 × 40 + [40 to 50] or **M1** for one from 3 × 40 + [40 to 50] or 4 × 40 + [40 to 50] or 5 × 40 + [40 to 50] OR **M1** for 210 ÷ 40 **A1** for final answer of 5 If 0 scored and no/insufficient working **SC1** for answer 4	Correct working requires at least M1 *n* represents an estimate of the number of spaces and/or punctuation, digits, symbols etc] Allow 40 × 5 = 200 for M1 Answer “4 to 5” or 5 with no working score 0

Question			Answer	Marks	Part marks and guidance	
	(b)		72 [seconds]	B1		
			$\frac{40}{60} \times$ *their* 72 oe or $\frac{52}{\textit{their}\ 72} \times 60$ oe	M1		
			OR			
			1.2 oe	B1		oe may be $1\frac{12}{60}$ oe
			40 × *their* 1.2 oe or 52 ÷ *their* 1.2	M1		*their* 1.2 is not 1.12
			AND			
			48 or 43.[3…] and short/shorter word length oe	A1		Ignore non-contradictory statements but, “He may type faster” is incorrect and, if included, scores A0

Question			Answer	Marks	Part marks and guidance	
20			60 with correct working	**5**		For full marks, correct working requires Pythagoras or trig leading to 12
					B3 for 12 as third side with correct working or **M2** for $\sqrt{13^2 - 5^2}$ oe or **M1** for $13^2 = 5^2 + [DC^2]$	For B3 "correct working" requires evidence of M2 or M1 or mention of 5:12:13 triangle
					OR	
					M1 for $\angle BDC = \sin^{-1}\left(\frac{5}{13}\right)$ oe or $\angle CBD = \cos^{-1}\left(\frac{5}{13}\right)$ oe	22.6... or 67.3 to 67.4 oe may be in ΔABD
					M1 for 13 cos *their* $\angle BDC$ or 13 sin *their* $\angle CBD$	
					AND	
					M1 for $5 \times$ *their* DC (or AB)	*Their* DC (or AB) not = 13.
					If 0 or 1 scored with no/insufficient working **SC2** for answer 60 or If 0 scored with no/insufficient working **SC1** for 12 as third side	If M1 scored and SC2 available, award SC2 only May be on diagram

Question			Answer	Marks	Part marks and guidance	
21	(a)		2 cao	1		
	(b)	(i)	$y = 2x + 3$	1		Allow, "The first one" oe for $y = 2x + 3$
		(ii)	Comment: Rejecting 4 [as gradient] and/or indicating $2 > \frac{1}{2}$	1		See appendix
	(c)		$2 \times 45 - 1$ soi 89 or $(90 + 1) \div 2$ soi 45.5 oe Below	M1 A1		

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td>22</td><td>(a)</td><td></td><td>$x \times x$ or $4(2x + 5)$ seen

$x^2 = 8x + 20$ or $x^2 = 4(2x + 5)$

Correctly rearranging to
$x^2 – 8x – 20 = 0$ without error</td><td>M1

M1

A1</td><td>Dependent on first M1 and not from rearrangement of original equation</td><td>Allow [area of] square = x^2 or [area of] rectangle = $8x + 20$
x^2 and /or $8x + 20$ may be written with correct shape(s)</td></tr>
<tr><td></td><td>(b)</td><td></td><td>$^{-}2$ 10 nfww</td><td>3</td><td>B2 for one correct solution nfww

OR
M2 for $(x + 2)(x – 10) = 0$
or
M1 for $(x + a)(x + b)$ where $ab = –20$ or $a + b = {}^{-}8$

OR
M2 for two correct trials using $^{-}4 \le x \le 0$ and two correct trials using $8 \le x \le 12$
or
M1 for two correct trials using $^{-}4 \le x \le 0$ or two correct trials using $8 \le x \le 12$

If 0 scored SC1 for answers 2 and –10</td><td>e.g. one trial is when $x = 2$,
$2^2 – 8 \times 2 – 20 = –32$
Accept as trial $x = 2$ and –32
x
<table><tr><td>-4</td><td>16</td><td>32</td><td>-20</td><td>28</td></tr><tr><td>-3</td><td>9</td><td>24</td><td>-20</td><td>13</td></tr><tr><td>-2</td><td>4</td><td>16</td><td>-20</td><td>0</td></tr><tr><td>-1</td><td>1</td><td>8</td><td>-20</td><td>-11</td></tr><tr><td>0</td><td>0</td><td>0</td><td>-20</td><td>-20</td></tr></table>
<table><tr><td>8</td><td>64</td><td>-64</td><td>-20</td><td>-20</td></tr><tr><td>9</td><td>81</td><td>-72</td><td>-20</td><td>-11</td></tr><tr><td>10</td><td>100</td><td>-80</td><td>-20</td><td>0</td></tr><tr><td>11</td><td>121</td><td>-88</td><td>-20</td><td>13</td></tr><tr><td>12</td><td>144</td><td>-96</td><td>-20</td><td>28</td></tr></table></td></tr>
<tr><td></td><td>(c)</td><td></td><td>Length [of square] cannot be negative</td><td>1</td><td>Dependent on negative answer in (b)</td><td>Do not accept x cannot be negative</td></tr>
<tr><td></td><td>(d)</td><td>(i)</td><td>100</td><td>1</td><td>FT (their positive root from (b) $)^2$</td><td rowspan="2">If two positive roots seen in (b) accept either or both used in (i) and in (ii) BUT, if one answer right and one wrong in any part, 0 marks</td></tr>
<tr><td></td><td>(d)</td><td>(ii)</td><td>25</td><td>1</td><td>FT (their positive root from (b) $) \times 2 + 5$</td></tr>
</table>

Question			Answer	Marks	Part marks and guidance	
23			5 : 6 nfww	**4**		Accept for all part marks *n* replaced by a consistent integer
					B3 for 5*kn* : 6*kn* *k* > 0 or equivalent correct unsimplified ratio seen	e.g. 2.5*n* : 3*n* or 5*n* : 6*n* or 10 : 12 etc
					OR	
					M1 for two ratios with a common number of mints implied by … : 10*k* **and** 10*k* : … seen, *k* > 0 with one correct ratio or 2.5*n* : 5 seen	May be seen as two separate ratios Eg 5*n* : 10 and 10 : 6*n* or 10 : 20 and 20 : 12 etc
					A1 for 5*kn* : 10*k* : 6*kn*	For **M1** the examples just require the common 10 or the common 20 etc