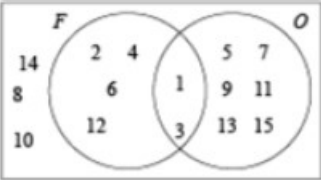


Topical Worksheets for Cambridge IGCSE™
Mathematics (0580)

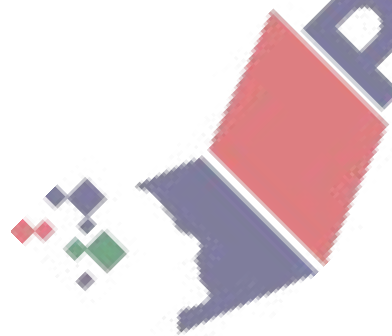
Probability (II)

Mark Scheme

1st edition, for examination until 2025

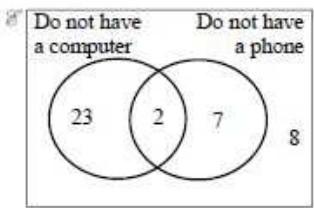
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	0.22 oe	2		M1 for $0.15 + 0.2 + ? + 0.43 = 1$ or better	
1(b)	40	1			
2(a)		2		B1 for 2 or 3 correctly completed regions	
2(b)	One of 5, 7, 9, 11, 13, 15	1		FT <i>their</i> Venn diagram	
2(c)	12	1		FT <i>their</i> Venn diagram	
2(d)	$\frac{8}{15}$ oe	1		FT <i>their</i> Venn diagram	
3(a)(i)	$1.5 < h \leq 1.6$	1			
3(a)(ii)	1.62 or 1.623... nfw	4		M1 for 1.35, 1.45, 1.55, 1.65, 1.75 1.85 soi M1 for Σfx M1 dep for <i>their</i> $\Sigma fx \div 120$	

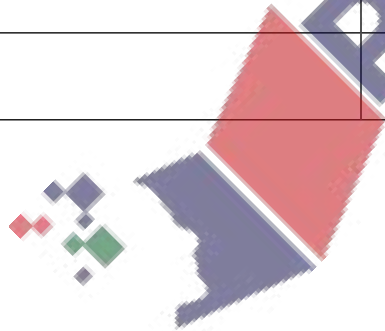
Question	Answer	Marks	AO Element	Notes	Guidance
3(b)(i)	$\frac{14}{120}$ oe	1			
3(b)(ii)	$\frac{21}{20060}$ oe	4		<p>M3 for $3 \left(\frac{14}{120} \times \frac{7}{119} \times \frac{6}{118} \right)$</p> <p>or M2 for $\frac{14}{120} \times \frac{7}{119} \times \frac{6}{118}$ isw</p> <p>or M1 for $\frac{14}{120}, \frac{7}{119}, \frac{6}{118}$</p> <p>After 0 scored, SC1 for answer $\frac{343}{864000}$ or $\frac{343}{288000}$ oe</p>	
3(c)(i)	55, 79, 106, 120	2		B1 for 2 or 3 correct	



Question	Answer	Marks	AO Element	Notes	Guidance
3(c)(ii)	Correct diagram	3		<p>B1 for correct horizontal plots</p> <p>B1FT for correct vertical plots</p> <p>B1FT dep on at least B1 for reasonable increasing curve or polygon through <i>their</i> 6 points</p> <p>If 0 scored SC1 for 5 out of 6 points correctly plotted</p>	
3(d)(i)	1.62 to 1.63	1			
3(d)(ii)	1.57 to 1.58	2		B1 for 48 soi	
4(a)	E cao	1			
4(b)	H cao	1			
5(a)	Arrow at $\frac{1}{2}$	1			
5(b)	Arrow at $\frac{11}{16}$	1			

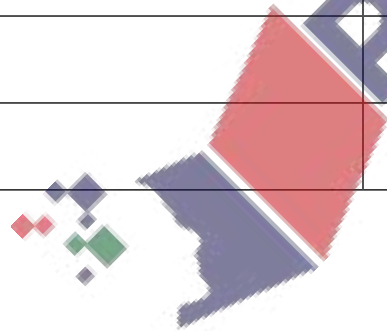
Question	Answer	Marks	AO Element	Notes	Guidance
6	$\frac{147}{160}$ oe	3		<p>M2 for $\frac{1}{10} \times \frac{3}{4} + \frac{9}{10} \times \frac{15}{16}$ or M1 for $\frac{1}{10} \times \frac{3}{4}$ or $\frac{9}{10} \times \frac{15}{16}$</p>	
7	72	2		M1 for $\frac{9}{25} \times 200$ oe	
8	0.41	2		M1 for $1 - (0.35 + 0.04 + 0.2)$	
9(a)	$\frac{11}{30}$ oe	1			
9(b)	$\frac{25}{30}$ oe	1			
9(c)	0	1			
10(a)	[0].62 oe	1			
10(b)	0	1			
11	0.73 oe	1			
12	48	1			

Question	Answer	Marks	AO Element	Notes	Guidance
13	0	1			
14	$\frac{2}{20}$ oe	2		M1 for $\frac{2}{5} \times \frac{1}{4}$ oe	
15(a)	$\frac{8}{15}$ oe	1			
15(b)		2		B1 for 2 or 3 correct out of 4 regions	
16(a)	$\frac{9}{16}$ oe	2		B1 for $\frac{9}{k}$ or $\frac{k}{16}$ provided fraction is less than 1	
16(b)	46	1			
17(a)	4	1			

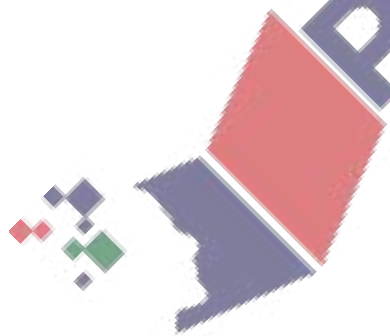


Question	Answer	Marks	AO Element	Notes	Guidance
17(b)	3 correct bars drawn on bar chart	4		<p>B1 for Mr Smith bar drawn height 15</p> <p>M2 for <i>their</i> $(80 - (18 + 14 + 15)) \div 3[\times 2]$</p> <p>or</p> <p>M1 for $80 - (18 + 14 + 15)$ oe</p>	
17(c)	Mrs Brown	1		FT <i>their</i> bar chart provided 5 bars drawn	
17(d)(i)	$\frac{14}{80}$ oe	1			
17(d)(ii)	$\frac{48}{80}$ oe	2		<p>FT <i>their</i> bar chart</p> <p>M1 for $80 - (18 + 14)$ or $\frac{18 + 14}{80}$ oe</p> <p>OR</p> <p>M1FT for adding heights of bars for (Mr Jones, Mrs Brown and Mr Smith)</p>	
17(e)	81	2		<p>M1 for $\frac{360}{80} [\times 18]$</p> <p>or $\frac{18}{80} [\times 360]$</p>	

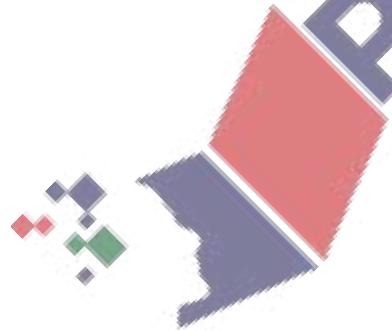
Question	Answer	Marks	AO Element	Notes	Guidance
18(a)	Correct bar	3		M1 for 5, 12, 17 or 34 M1 for 40 – <i>their</i> 34	
18(b)	5	1			
18(c)	Adult	1		FT	
18(d)	$\frac{12}{40}$ oe	1			
19(a)(i)	Correct frequencies 8 5 3 5 2 1	2		B1 for 1 frequency incorrect or 2 incorrect but total still 24 or 8 5 3 5 2 1 in tally column If 0 scored, B1 for completely correct tallies	
19(a)(ii)	1	1			
19(a)(iii)	5	1			
19(a)(iv)	2	1			



Question	Answer	Marks	AO Element	Notes	Guidance
19(a)(v)	2.625	3		<p>M1 for Σfx $1 \times 8 + 2 \times 5 + 3 \times 3 + 4 \times 5 + 5 \times 2 + 6 \times 1$</p> <p>M1 dep for <i>their</i> $\Sigma fx \div 24$</p>	
19(a)(vi)	$\frac{5}{24}$ oe	1		FT <i>their</i> table	
19(b)	Correct bar chart	2		B1 for 2 or 3 correct bars or for all 4 heights correct	
19(c)	Correct generalised comparison	1			
20(a)	$1 - r$	1			
20(b)(i)	$(1 - r)(1.3 - r) [= 0.4]$	1		FT <i>their</i> (a) dep on (a) being an expression in r	



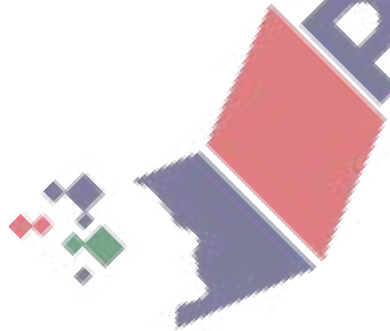
Question	Answer	Marks	AO Element	Notes	Guidance
20(b)(ii)	<p>M1 for $1.3 - 1.3r - r + r^2$ or better nfw</p> <p>M1 for $0.9 - 2.3r + r^2 [= 0]$</p> <p>OR</p> <p>$13 - 13r - 10r + 10r^2 = 4$ oe</p> <p>A1 for $10r^2 - 23r + 9 = 0$</p>	3		<p>FT <i>their</i> (b)(i)</p> <p>Strict FT <i>their</i> expansion to a quadratic then equating to 0.4 and then collecting to 3 terms on 'one side'</p> <p>OR</p> <p>Strict FT <i>their</i> expansion to a quadratic = 0.4 all multiplied by 10</p> <p>no errors or omissions seen</p>	



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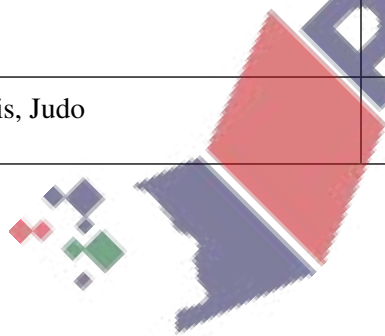
Question	Answer	Marks	AO Element	Notes	Guidance
20(b)(iii)	<p>B2 for $(5r - 9)(2r - 1) [= 0]$</p> <p>B1 for $[r =] \frac{9}{5}$ oe $[r =] \frac{1}{2}$ oe</p>	3		<p>or B2 for e.g. $5r(2r - 1) - 9(2r - 1)$ and then $5r - 9 = 0$ and $2r - 1 = 0$</p> <p>or B1 for $5r(2r - 1) - 9(2r - 1) [= 0]$ or $2r(5r - 9) - 1(5r - 9) [= 0]$ or $(5r + a)(2r + b) [= 0]$ where a, b are integers and $ab = +9$ or $2a + 5b = -23$</p> <p>If 0 scored, SC1 for $5r - 9$ and $2r - 1$ seen but not in factorised form</p>	
20(b)(iv)	0.8 or $\frac{4}{5}$ oe	1			
21(a)	<p>B1 for range = 7</p> <p>B1 for mode = 21</p> <p>B2 for median = 22.5</p> <p>B2 for mean = 22.7 or 22.71...</p>	6		<p>M1 for evidence of middle value</p> <p>M1 for use of $\Sigma x \div 14$</p>	
21(b)	$\frac{3}{14}$ oe	1			

Question	Answer	Marks	AO Element	Notes	Guidance
22	$\frac{1}{6}$ oe	4		<p>M3 for $\frac{5}{9} \times \frac{4}{8} \times \frac{3}{7} + \frac{4}{9} \times \frac{3}{8} \times \frac{2}{7}$</p> <p>or M2 for $\frac{5}{9} \times \frac{4}{8} \times \frac{3}{7}$</p> <p>or $\frac{4}{9} \times \frac{3}{8} \times \frac{2}{7}$</p> <p>or M1 for $\frac{5}{9}, \frac{4}{8}, \frac{3}{7}$ seen or $\frac{4}{9}, \frac{3}{8}, \frac{2}{7}$ seen</p> <p>If 0 scored, SC1 for $\frac{5^3 + 4^3}{729}$ oe</p>	
23(a)	$\frac{x-1}{x+2}$	2		B1 for either numerator or denominator correct	

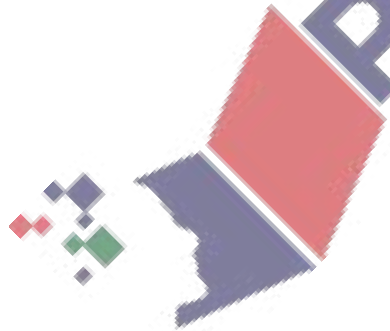


Question	Answer	Marks	AO Element	Notes	Guidance
23(b)(i)	<p>B1 for $\frac{x}{x+3} \times \frac{x-1}{x+2} = \frac{7}{15}$</p> <p>M1 for $15x(x-1) = 7(x+3)(x+2)$</p> <p>M1 for $15x^2 - 15x = 7x^2 + 21x + 14x + 42$</p> <p>A1 for $[8x^2 - 50x - 42 = 0]$ $4x^2 - 25x - 21 = 0$</p>	4		<p>FT <i>their</i> (a)(i) = $\frac{7}{15}$</p> <p>Removes all algebraic fractions FT <i>their</i> equation if in comparable form</p> <p>Correctly expands all brackets FT <i>their</i> equation if in comparable form</p> <p>With no errors or omissions seen and one further stage seen after final M1</p>	
23(b)(ii)	<p>M2 for $(4x + 3)(x - 7) [= 0]$</p> <p>B1 for 7 and $-\frac{3}{4}$</p>	3		<p>M1 for $4x(x-7) + 3(x-7)$ or $x(4x-3) - 7(4x-3)$ or for $(4x+a)(x+b)$ where either $ab = -21$ or $4b + a = -25$</p> <p>If 0 scored, SC1 for $4x + 3$ and $x - 7$ seen but not in factorised form</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
23(b)(iii)	7	1		FT <i>their</i> positive solution	
24	[0].03 oe	1			
25	70	2		M1 for $25\,000 \times 0.0028$ oe	
26(a)(i)	Swimming	1			
26(a)(ii)	$\frac{72}{360}$ oe	1			
26(a)(iii)	5 cao	2		M1 for $\frac{30}{360}$ [$\times 60$] or $\frac{60}{360}$ [$\times 30$] or for $\frac{360}{60}$ soi by 6	
26(a)(iv)	$\frac{55}{60}$ oe	1		FT $\frac{60 - \textit{their(a)(iii)}}{60}$ oe	
26(a)(v)	Tennis, Judo	1			




Question	Answer	Marks	AO Element	Notes	Guidance
26(b)	2 sectors drawn: Running 60° Swimming 132°	2		M1 for use of 12° implied by 60° or 132° seen or for 10 [boys] or 22 [boys] seen	
26(c)	A valid correct similarity and difference	2		B1 for each	
27	$\frac{80}{153}$ oe	3		M2 for $2 \times \frac{10}{18} \times \frac{8}{17}$ oe or M1 for $\frac{10}{18} \times \frac{8}{17}$ oe If 0 scored, SC1 for $\frac{160}{324}$ oe	




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Question	Answer	Marks	AO Element	Notes	Guidance
28	$\frac{11}{51}$ oe	4		<p>M3 for $\frac{10}{18} \times \frac{9}{17} \times \frac{8}{16}$ $+ \frac{8}{18} \times \frac{7}{17} \times \frac{6}{16}$ oe or M2 for $\frac{10}{18} \times \frac{9}{17} \times \frac{8}{16}$ oe or $\frac{8}{18} \times \frac{7}{17} \times \frac{6}{16}$ oe or M1 for $\frac{10}{18}, \frac{9}{17}, \frac{8}{16}$ or $\frac{8}{18}, \frac{7}{17}, \frac{6}{16}$ If 0 scored, SC1 for $\frac{1512}{5832}$ oe</p>	
29	$\frac{5}{9}$ oe	1			
30(a)	111.25	4		<p>M1 for midpoints soi (25, 75, 112.5, 137.5, 175) M1 for $\sum fx$ with x in correct interval including both boundaries M1 (dep on 2nd M1) for $\sum fx \div 20$</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
30(b)	2 7 11 17	2		B1 for three correct	
30(c)	$\frac{3}{20}$ oe	1			
31(a)	Arrow at $\frac{3}{4}$	1		Clear indication	
31(b)	Arrow at 0	1		Clear indication	
32(a)	Arrow at 0.2	1			
32(b)	0.8 oe	1			
33	[0].36 oe	1			
34	0.27 oe	2		M1 for 1 – (0.2 + 0.45 + 0.08) oe	
35(a)	$\frac{94}{200}$ oe	2		M1 for $\frac{46}{200} + \frac{48}{200}$ oe	
35(b)	14.1 or 14.07... 	3		M2 for $2 \left(\frac{50}{200} \times \frac{56}{199} \right)$ oe or M1 for $\frac{50}{200} \times \frac{56}{199}$ oe	

Question	Answer	Marks	AO Element	Notes	Guidance
36	540	2		M1 for $\frac{18}{50}$ [$\times 1500$] or $\frac{1500}{50}$ [$\times 18$]	
37(a)	96 144 240 129 131 260 225 275 500	1		both correct	
37(b)	50	1			
37(c)	$\frac{9}{20}$	2		B1 for $\frac{225}{500}$ or $\frac{45}{100}$ or 0.45	
37(d)	12 : 13	2		B1 for 240 : 260 oe If 0 scored, SC1 for answer 13 : 12	
37(e)	$\frac{144}{500}$ oe	1			
38(a)	Negative	1			
38(b)	$\frac{10}{17}$ oe	1			

Question	Answer	Marks	AO Element	Notes	Guidance
38(c)	Correct ruled line of best fit	1			
38(d)	5 or 6	1		must be an integer	
39(a)	$\frac{4}{20}$ oe	1			
39(b)	0	1			
39(c)	$\frac{17}{20}$ oe	1			
40(a)	14	1			
40(b)	16	1			
40(c)	$\frac{20}{462}$ oe	3		M2 for $\frac{5}{22} \times \frac{4}{21}$ or M1 for $\frac{5}{22}$ seen	
40(d)	Correct shading 	1			

Question	Answer	Marks	AO Element	Notes	Guidance
					[Total: 174]

