



# r/IGCSE Resources

Topical Worksheets for Cambridge IGCSE™  
Mathematics (0580/0980)

**Probability (I)**

**[Mark Scheme](#)**

1<sup>st</sup> edition, for examination until 2025

Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	$20 [ < t \leq ] 25$	<b>1</b>			
1(b)	$25 [ < t \leq ] 30$	<b>1</b>			
1(c)	28.3 or 28.33..	<b>4</b>		<p><b>M1</b> for 22.5, 27.5, 32.5, 37.5, 42.5 soi</p> <p><b>M1</b> for <math>\sum fx</math> where <math>x</math> is in the correct interval including boundaries</p> <p><b>M1dep</b> for <math>\sum fx \div 120</math> or <math>\sum fx \div (44 + 32 + 28 + 12 + 4)</math></p>	
1(d)	$\frac{4}{120}$ oe isw	<b>1</b>			
2(a)	$\frac{9}{20}$ oe	<b>1</b>			
2(b)(i)	<p><b>M1</b> for <math>\frac{6}{20} \times \frac{5}{19}</math></p> <p><b>A1</b> for <math>\frac{30}{380}</math> oe</p>	<b>2</b>			

Question	Answer	Marks	AO Element	Notes	Guidance
2(b)(ii)	$\frac{258}{380}$ oe	4		<p><b>M3</b> for</p> $1 - \frac{3}{38} - \frac{5}{20} \times \frac{4}{19}$ $- \frac{9}{20} \times \frac{8}{19}$ <p>oe</p> <p>or <b>M2</b> for</p> $\frac{3}{38} + \frac{5}{20} \times \frac{4}{19} + \frac{9}{20} \times \frac{8}{19}$ <p>or</p> $\frac{5}{20} \times \frac{9}{19} + \frac{6}{20} \times \frac{9}{19}$ $+ \frac{6}{20} \times \frac{5}{19}$ <p>oe</p> <p>or <b>M1</b> for for one correct product other than</p> $\frac{6}{20} \times \frac{5}{19}$	
3(a)(i)	$1.5 < h \leq 1.6$	1			
3(a)(ii)	1.62 or 1.623... nfw	4		<p><b>M1</b> for 1.35, 1.45, 1.55, 1.65, 1.75 1.85 soi</p> <p><b>M1</b> for <math>\Sigma fx</math></p> <p><b>M1 dep</b> for <i>their</i> <math>\Sigma fx \div 120</math></p>	
3(b)(i)	$\frac{14}{120}$ oe	1			

Question	Answer	Marks	AO Element	Notes	Guidance
3(b)(ii)	$\frac{21}{20060}$ oe	4		<p><b>M3</b> for</p> $3 \left( \frac{14}{120} \times \frac{7}{119} \times \frac{6}{118} \right)$ <p>or <b>M2</b> for</p> $\frac{14}{120} \times \frac{7}{119} \times \frac{6}{118} \text{ isw}$ <p>or <b>M1</b> for</p> $\frac{14}{120}, \frac{7}{119}, \frac{6}{118}$ <p>After 0 scored, <b>SC1</b> for answer</p> $\frac{343}{864000} \text{ or } \frac{343}{288000}$ <p>oe</p>	
3(c)(i)	55, 79, 106, 120	2		<b>B1</b> for 2 or 3 correct	
3(c)(ii)	Correct diagram	3		<p><b>B1</b> for correct horizontal plots</p> <p><b>B1FT</b> for correct vertical plots</p> <p><b>B1FT dep on at least B1</b> for reasonable increasing curve or polygon through <i>their</i> 6 points</p> <p>If 0 scored <b>SC1</b> for 5 out of 6 points correctly plotted</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
3(d)(i)	1.62 to 1.63	1			
3(d)(ii)	1.57 to 1.58	2		<b>B1</b> for 48 soi	
4(a)	$\frac{11}{30}$ oe	1			
4(b)	$\frac{25}{30}$ oe	1			
4(c)	0	1			
5	0	1			
6	$\frac{147}{160}$ oe	3		<b>M2</b> for $\frac{1}{10} \times \frac{3}{4} + \frac{9}{10} \times \frac{15}{16}$ or <b>M1</b> for $\frac{1}{10} \times \frac{3}{4}$ or $\frac{9}{10} \times \frac{15}{16}$	
7	$\frac{2}{20}$ oe	2		<b>M1</b> for $\frac{2}{5} \times \frac{1}{4}$ oe	
8(a)	$\frac{9}{16}$ oe	2		<b>B1</b> for $\frac{9}{k}$ or $\frac{k}{16}$ provided fraction is less than 1	

Question	Answer	Marks	AO Element	Notes	Guidance
8(b)	46	1			
9(a)	$1 - r$	1			
9(b)(i)	$(1 - r)(1.3 - r) [= 0.4]$	1		<b>FT</b> <i>their (a)</i> dep on <b>(a)</b> being an expression in $r$	
9(b)(ii)	<p><b>M1</b> for <math>1.3 - 1.3r - r + r^2</math> or better nfww</p> <p><b>M1</b> for <math>0.9 - 2.3r + r^2 [= 0]</math></p> <p>OR</p> <p><math>13 - 13r - 10r + 10r^2 = 4</math> oe</p> <p><b>A1</b> for <math>10r^2 - 23r + 9 = 0</math></p>	3		<p><b>FT</b> <i>their (b)(i)</i></p> <p><b>Strict FT</b> <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><b>Strict FT</b> <i>their</i> expansion to a quadratic = 0.4 all multiplied by 10</p> <p>no errors or omissions seen</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
9(b)(iii)	<p><b>B2</b> for <math>(5r - 9)(2r - 1) [= 0]</math></p> <p><b>B1</b> for <math>[r =] \frac{9}{5}</math> oe <math>[r =] \frac{1}{2}</math> oe</p>	<b>3</b>		<p>or <b>B2</b> for e.g.  <math>5r(2r - 1) - 9(2r - 1)</math> <b>and</b>  <b>then</b> <math>5r - 9 = 0</math>  <b>and</b> <math>2r - 1 = 0</math></p> <p>or <b>B1</b> for  <math>5r(2r - 1) - 9(2r - 1) [= 0]</math>  or  <math>2r(5r - 9) - 1(5r - 9) [= 0]</math>  or  <math>(5r + a)(2r + b) [= 0]</math>  where <math>a, b</math> are integers  and <math>ab = +9</math>  or <math>2a + 5b = -23</math></p> <p>If 0 scored, <b>SC1</b> for  <math>5r - 9</math> <b>and</b> <math>2r - 1</math> seen  but not in factorised  form</p>	
9(b)(iv)	0.8 or $\frac{4}{5}$ oe	<b>1</b>			

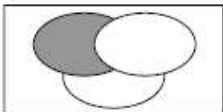
Question	Answer	Marks	AO Element	Notes	Guidance
10	$\frac{1}{6}$ oe	4		<p><b>M3</b> for  <math>\frac{5}{9} \times \frac{4}{8} \times \frac{3}{7} + \frac{4}{9} \times \frac{3}{8} \times \frac{2}{7}</math></p> <p>or <b>M2</b> for <math>\frac{5}{9} \times \frac{4}{8} \times \frac{3}{7}</math>  or <math>\frac{4}{9} \times \frac{3}{8} \times \frac{2}{7}</math></p> <p>or <b>M1</b> for  <math>\frac{5}{9}, \frac{4}{8}, \frac{3}{7}</math> seen  or <math>\frac{4}{9}, \frac{3}{8}, \frac{2}{7}</math> seen</p> <p>If 0 scored, <b>SC1</b> for  <math>\frac{5^3 + 4^3}{729}</math> oe</p>	
11(a)	$\frac{x-1}{x+2}$	2		<b>B1</b> for either numerator or denominator correct	



Question	Answer	Marks	AO Element	Notes	Guidance
11(b)(i)	<p><b>B1</b> for <math>\frac{x}{x+3} \times \frac{x-1}{x+2} = \frac{7}{15}</math></p> <p><b>M1</b> for  <math>15x(x-1) = 7(x+3)(x+2)</math></p> <p><b>M1</b> for  <math>15x^2 - 15x = 7x^2 + 21x + 14x + 42</math></p> <p><b>A1</b> for  <math>[8x^2 - 50x - 42 = 0]</math></p> <p><math>4x^2 - 25x - 21 = 0</math></p>	<b>4</b>		<p><b>FT</b> <i>their</i> (a)(i) = <math>\frac{7}{15}</math></p> <p>Removes all algebraic fractions  <b>FT</b> <i>their</i> equation if in comparable form</p> <p>Correctly expands all brackets  <b>FT</b> <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>	
11(b)(ii)	<p><b>M2</b> for <math>(4x+3)(x-7) [= 0]</math></p> <p><b>B1</b> for 7 and <math>-\frac{3}{4}</math></p>	<b>3</b>		<p><b>M1</b> for  <math>4x(x-7) + 3(x-7)</math> or  <math>x(4x-3) - 7(4x-3)</math>  or for <math>(4x+a)(x+b)</math>  where either <math>ab = -21</math> or  <math>4b + a = -25</math></p> <p>If 0 scored, <b>SC1</b> for  <math>4x+3</math> <b>and</b> <math>x-7</math> seen but  not in factorised form</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
11(b)(iii)	7	1		<b>FT</b> <i>their</i> positive solution	
12	$\frac{80}{153}$ oe	3		<b>M2</b> for $2 \times \frac{10}{18} \times \frac{8}{17}$ oe  or <b>M1</b> for $\frac{10}{18} \times \frac{8}{17}$ oe  If 0 scored, <b>SC1</b> for $\frac{160}{324}$ oe	
13	$\frac{11}{51}$ oe	4		<b>M3</b> 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 <b>M2</b> 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 <b>M1</b> for $\frac{10}{18}, \frac{9}{17}, \frac{8}{16}$ or $\frac{8}{18}, \frac{7}{17}, \frac{6}{16}$  If 0 scored, <b>SC1</b> for $\frac{1512}{5832}$ oe	

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14(a)	111.25	4		<p><b>M1</b> for midpoints soi (25, 75, 112.5, 137.5, 175)</p> <p><b>M1</b> for <math>\sum fx</math> with <math>x</math> in correct interval including both boundaries</p> <p><b>M1</b> (dep on 2nd <b>M1</b>) for <math>\sum fx \div 20</math></p>	
14(b)	2 7 11 17	2		<b>B1</b> for three correct	
14(c)	$\frac{3}{20}$ oe	1			
15(a)	$\frac{94}{200}$ oe	2		<b>M1</b> for $\frac{46}{200} + \frac{48}{200}$ oe	
15(b)	14.1 or 14.07...	3		<p><b>M2</b> for <math>2 \left( \frac{50}{200} \times \frac{56}{199} \right)</math> oe</p> <p>or <b>M1</b> for <math>\frac{50}{200} \times \frac{56}{199}</math> oe</p>	
16(a)	14	1			
16(b)	16	1			

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16(c)	$\frac{20}{462}$ oe	3		<b>M2</b> for $\frac{5}{22} \times \frac{4}{21}$ or <b>M1</b> for $\frac{5}{22}$ seen	
16(d)	Correct shading 	1			
17(a)	$\frac{3}{5} > \frac{1}{4}$ oe or $\frac{12k}{20k}$ and $\frac{5k}{20k}$ or 0.6 and 0.25 or 60% and 25%	1			
17(b)	$\frac{11}{20}$ oe	3		<b>M2</b> for $\frac{3}{5} \times \frac{3}{4} + \frac{2}{5} \times \frac{1}{4}$ oe or $1 - \frac{3}{5} \times \frac{1}{4} - \frac{2}{5} \times \frac{3}{4}$ oe or <b>M1</b> for $\frac{3}{5} \times \frac{3}{4}$ or $\frac{2}{5} \times \frac{1}{4}$ oe (but not as part of a larger product)	

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18	$\frac{11}{25}$ oe	3		<p><b>M2</b> for <math>\frac{3}{5} \times \frac{3}{5} + \frac{2}{5} \times \frac{1}{5}</math> oe or <math>1 - \frac{3}{5} \times \frac{2}{5} - \frac{2}{5} \times \frac{4}{5}</math> oe</p> <p>or <b>M1</b> for <math>\frac{3}{5} \times \frac{3}{5}</math> or <math>\frac{2}{5} \times \frac{1}{5}</math> or for a correct tree showing all 25 outcomes with the 11 correct outcomes identified</p>	
19(a)(i)	$\frac{10}{20} \times \frac{9}{19}$ oe	<b>M2</b>		<b>B1</b> for $\frac{9}{19}$ oe seen	

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19(a)(ii)	$\frac{62}{95}$ oe	4		<p><b>M3</b> for</p> $\frac{6}{20} \times \frac{14}{19} + \frac{10}{20} \times \frac{10}{19}$ $+ \frac{4}{20} \times \frac{16}{19}$ <p>oe</p> <p>or</p> $1 - \frac{6}{20} \times \frac{5}{19} - \frac{10}{20} \times \frac{9}{19}$ $- \frac{4}{20} \times \frac{3}{19}$ <p>oe</p> <p>or <b>M2</b> for the sum of two products of different flavours isw</p> <p>or <b>M1</b> for one correct product of different flavours isw</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
19(b)	$\frac{5}{57}$ oe	3		<p><b>M2</b> for</p> $N \times \left( \frac{4}{20} \times \frac{3}{19} \times \frac{16}{18} \right) + \frac{4}{20} \times \frac{3}{19} \times \frac{2}{18}$ <p>oe</p> <p>or for</p> $3 \left( \frac{4}{20} \times \frac{3}{19} \times \frac{16}{18} \right) \text{ oe}$ <p>or</p> $1 - \left\{ N \times \left( \frac{4}{20} \times \frac{16}{19} \times \frac{15}{18} \right) + \frac{16}{20} \times \frac{15}{19} \times \frac{14}{18} \right\}$ <p>oe</p> <p>or <b>M1</b> for <math>\frac{4}{20} \times \frac{3}{19} \times \frac{k}{18}</math></p> <p>oe seen</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
20(a)	$\frac{8}{20}$ oe	3		<p><b>M2</b> for <math>\frac{2}{5} \times \frac{1}{4} + \frac{3}{5} \times \frac{2}{4}</math></p> <p>or <b>M1</b> for one of these products</p> <p>OR</p> <p><b>M1</b> for probability tree identifying all 20 outcomes with the correct 8 identified</p> <p>OR</p> <p><b>M1</b> for completed possibility space / 2-way table identifying the 8 possible outcomes out of 20, oe</p> <p><b>SC1</b> for <math>\frac{13}{25}</math> with replacement</p>	



Question	Answer	Marks	AO Element	Notes	Guidance
20(b)	$\frac{9}{25}$ oe	<b>3</b>		<p><b>M2</b> for <math>\frac{2}{5} \times \frac{3}{5} + \frac{3}{5} \times \frac{1}{5}</math> oe</p> <p>or <b>M1</b> for one of these products</p> <p>OR</p> <p><b>M1</b> for probability tree identifying all 25 outcomes with the correct 9 identified</p> <p>OR</p> <p><b>M1</b> for completed possibility space / 2-way table identifying the 9 possible outcomes out of 25, oe</p>	
20(c)	Jojo and e.g. $\frac{40}{100} > \frac{36}{100}$	<b>1</b>		<p><b>1FT</b> <i>their</i> <b>(a)</b> and <b>(b)</b> dep on being in range 0 to 1</p>	
[Total: 115]					