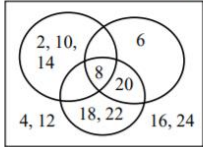


Probability Past Paper Answers GCSE Edexcel - Calculator

1.

Answer	Mark	Mark scheme	Additional guidance
21	P1	for a relevant probability, eg $P(\text{green}) = \frac{x}{2x+3}$ or $P(\text{blue}) = \frac{x+3}{2x+3}$	the number of green and blue pens could be $x - 3$ and x or equivalent probabilities must be in an algebraic form in a single variable This is an exception using replacements. No further credit is available
	P1	for a relevant product, eg. " $\frac{x}{2x+3}$ " \times " $\frac{x-1}{2x+2}$ " or " $\frac{x+3}{2x+3}$ " \times " $\frac{x+2}{2x+2}$ " OR $\left(\frac{x}{x+3}\right)^2 + \left(\frac{x+3}{2x+3}\right)^2 = \frac{27}{75}$	
	P1	forms an appropriate equation, eg. " $\frac{x}{2x+3} \times \frac{x-1}{2x+2}$ " + " $\frac{x+3}{2x+3} \times \frac{x+2}{2x+2}$ " = $\frac{27}{55}$	
	P1	(dep P3) process to reduce equation to $ax^2 + bx + c = 0$ eg. $x^2 - 25x + 84 = 0$	
	P1	process to solve quadratic equation eg. $(x - 21)(x - 4) = 0$	
	A1	cao	

2.

ion	Answer	Mark	Mark scheme	Additional guidance
(a)	Venn diagram	C4	fully correct Venn diagram	
		(C3	7 of the 8 regions correct or for a diagram with only one number incorrectly placed)	
		(C2	5 or 6 of the 8 regions correct)	
		(C1	3 or 4 of the 8 regions correct)	
(b)	$\frac{1}{12}$	M1	fit for identification of 1 or 12 eg from the diagram	Need not be written as a fraction or probability at this stage. eg could be a ratio 1:12
		A1	fit oe	Acceptable equivalents are (eg, could fit) any fraction equivalent to $\frac{1}{12}$, 0.08(33..) or 8(.33..)%

3.

ion	Answer	Mark	Mark scheme	Additional guidance
(a)	0.455	M1	for $0.65 \times (1 - 0.65)$ or 0.65×0.35 ($=0.2275$ or $\frac{91}{400}$) or 2×0.2275 oe	Could be shown on a tree diagram but must show an intention to multiply
		A1	oe	Acceptable equivalents are 45.5% or $\frac{91}{200}$ oe
(b)	42	M1	for a start of the process eg $78 \div 0.65$ ($=120$) or 78×0.35 ($=27.3$)	$\frac{78 \times 0.35}{0.65}$, $\frac{78}{0.65} - 78$
		A1	cao	

4.

Answer	Mark	Mark scheme	Additional guidance																				
$\frac{3}{22}$	P1	for a process to find a first value eg male/Britain = $32 - 11$ (=21) or Italy/total = $60 - (32+12)$ (=16) or female/total = $60 - 38$ (=22)	<table border="1"> <thead> <tr> <th></th> <th>Br</th> <th>Sp</th> <th>It</th> <th>Tot</th> </tr> </thead> <tbody> <tr> <td>M</td> <td>21</td> <td>9</td> <td>8</td> <td>38</td> </tr> <tr> <td>F</td> <td>11</td> <td>3</td> <td>8</td> <td>22</td> </tr> <tr> <td>Tot</td> <td>32</td> <td>12</td> <td>16</td> <td>60</td> </tr> </tbody> </table> <p>May be seen in a frequency tree Values attributed to a category or from method seen</p>		Br	Sp	It	Tot	M	21	9	8	38	F	11	3	8	22	Tot	32	12	16	60
		Br		Sp	It	Tot																	
	M	21		9	8	38																	
	F	11		3	8	22																	
Tot	32	12	16	60																			
P1	for process to find a secondary value, eg male/Spain = $38 - ("21" + 8)$ (=9) or female/Italy = $"16" - 8$ (=8)																						
P1	complete process to find female/Spain, eg $12 - "9"$ or $"22" - (11 + "8")$ (=3)																						
A1	oe accept 0.136 to 0.14 SC B3 for $\frac{3}{60}$																						

5.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	0.55, 0.67, 0.33, 0.35, 0.65	B1	for 0.55 in correct position	Can be seen as fractions or percentages
		B1	for the branches for the second game correct	
(b)	0.341	M1	for one correct product, eg $0.45 \times "0.33"$ (=0.1485) or $"0.55" \times "0.35"$ (=0.1925) or $0.45 \times "0.67"$ (=0.3015) or $"0.55" \times "0.65"$ (=0.3575)	Follow through acceptable for method marks from their tree in part (a) providing probabilities are less than 1. Accept fractional equivalents
		M1	for correct method eg $(0.45 \times "0.33") + ("0.55" \times "0.35")$ or $1 - (0.45 \times "0.67") - ("0.55" \times "0.65")$	
		A1	answer in range 0.34 – 0.341 oe	

6.

Question	Answer	Mark	Mark scheme	Additional guidance
	Probabilities should sum to 1 0.35 and 0.65 reversed	C1	for stating that the probabilities should total 1 eg 0.25 should be 0.35	Can be shown on the diagram
		C1	for recognising that the 0.35 and 0.65 in the first branches for the 2nd throw should be reversed eg, "for the second throw, the probability it lands on 4 should be 0.65"	

7.

tion	Answer	Mark	Mark scheme	Additional guidance
(a)	8	P1	for process to find sum of unknown probabilities, eg $1 - 0.45 - 0.25 (= 0.3)$ OR to find the total number of counters in the bag, eg $\frac{18}{0.45} (= 40)$ OR to find the number of yellow counters, eg $\frac{0.25}{0.45} \times 18 (= 10)$	Award mark for any two probabilities given that sum to 0.3 eg given in the table.
		P1	for process to find $P(\text{red}) = 0.2$ oe or $P(\text{white}) = 0.1$ oe OR for process to find the total number of red and white counters, eg “40” – 18 – “10” (=12) OR for process to derive an equation in x , eg $2x + x = 1 - 0.45 - 0.25$ or $2x + x = “0.3”$ or $x = 0.1$	Award P2 for $P(\text{red})$ or $P(\text{white})$ (could be shown in table) Equations could be given as written statements or working but must be fully equivalent.
		P1	for a complete process to find the number of red counters, eg $\frac{2 \times 0.1}{0.45} \times 18$ or $\frac{2}{3} \times “12”$ or $0.2 \times “40”$ or $\frac{0.2}{0.025}$	
		A1	cao	
(b)	Explanation	C1	for explanation eg 0.5 multiplied by an odd number will never be a whole number, for half of a number to be an integer that number must be even, you can't have half a marble	

8.

Answer	Mark	Mark scheme	Additional guidance
$\frac{6}{490}$	P1	for start to process information, eg draws Venn diagram and shows at least 1 unknown amount, eg 5 speak German and Spanish but not French	See Venn Diagram at end of mark scheme – rectangle not needed
	P1	for process to find at least 3 unknown amounts from, eg 5 speak German and Spanish but not French 3 speak French and German but not Spanish 22 speak French but not German or Spanish 0 speak German but not French or Spanish	
	P1	for complete process to find number of people who speak only Spanish (= 6)	Award first 3 marks to students who show this on the Venn diagram or in a statement.
	P1	for $\frac{[\text{number speaking Spanish only}]}{50} \times \frac{[\text{number speaking Spanish only}] - 1}{49}$, eg $\frac{6}{50} \times \frac{5}{49}$	Award this mark for use of their number of students who speak Spanish. Must be a clear link, eg from Venn diagram
	A1	for $\frac{6}{490}$ oe	See note 8 in general marking guidance but 0.01 or 1% must be from seen correct working.

9.

(a)		120	P1	for $\frac{4 \times 450}{15}$ or $\frac{4}{15} = \frac{x}{450}$ oe
			A1	cao
(b)		$\frac{165}{450}$	P1	5.5 or 6.5 or 165 or $\frac{5 \times 450}{15} (=150)$ and $\frac{6 \times 450}{15} (=180)$
			A1	for $\frac{165}{450}$ oe

10.

Question	Working	Answer	Mark	Notes
(a)		$\frac{1}{55}$	M1	for $\frac{4}{12} \times \frac{3}{11} \times \frac{2}{10}$
			A1	for $\frac{1}{55}$ oe
(b)		Conclusion (supported)	C1	starts correct argument, eg by calculating a relevant probability, eg $\frac{5}{15} \times \frac{4}{14} \times \frac{3}{13}$
			C1	statement of "more likely" from eg comparison of probabilities, ft answer to (a) eg $\frac{1}{55}$ (= 0.018...) and $\frac{2}{91}$ (= 0.021... or 0.022)

11.

(a)		0.05	B1	for 0.05 oe
(b)		20	C1	for stating that at least 20 required
		Reason	C1	for reason eg explains that number of each colour must be a whole number or that there must be (at least) 1 red counter or shows that $0.05 = \frac{1}{20}$

12.

		48	M1	for 0.25×0.6 (= 0.15) or 0.75×0.4 (= 0.3)
			M1	for 0.25×0.6 (= 0.15) and 0.75×0.4 (= 0.3) or for $24 \div "0.15"$ (= 160)
			A1	cao