

Probability

June 2023 Paper 2

Question	Answer	Mark	Mark scheme	Additional guidance
6 (a)	Cross marked at 0	B1		Allow if intention is clear
6 (b)	Cross marked at $\frac{1}{2}$	B1		Allow if intention is clear

June 2020 Paper 1

Question	Answer	Mark	Mark scheme	Additional guidance
6 (a)	cross at $\frac{1}{2}$	B1	Cross (or mark) at $\frac{1}{2}$	Accept any mark near to $\frac{1}{2}$ if the intention is clear; do not accept if any additional marks are shown
(b)	cross at 0	B1	Cross (or mark) at 0	Accept any mark near to 0 if the intention is clear; do not accept if any additional marks are shown

November 2024 Paper 2

Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	12	M1	for method to find mean, eg $(14 + 10 + 10 + 13 + 15 + 9 + 15 + 10) \div 8$ or $96 \div 8$	Allow one error or omission but must divide by 8 Condone eg 9, 15 but not $9 + 15$ Accept any mark near to $\frac{1}{4}$ if the intention is clear; do not accept if additional marks are shown
		A1	cao	
(b)	6	M1	for $15 - 9$ or $9 - 15$ or 9 to 15	
		A1	cao	
(c)	cross at $\frac{1}{4}$	B1	for cross (or mark) at $\frac{1}{4}$	

June 2023 Paper 3

Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	evens	C1	oe	
(b)	certain	C1	oe	
(c)	0.6	B1	oe	Accept 60% or an equivalent fraction eg $\frac{6}{10}$

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Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	A	B1	cao	
	Cross at correct position	B1	for cross at $\frac{1}{4}$	Cross or other indication may be seen on or near line provided within tolerance
	$\frac{1}{8}$	B1	for $\frac{1}{8}$ oe	Accept any equivalent fraction, decimal form 0.125 or percentage form 12.5% Do not accept 1 : 8 or 1 to 8 or 1 out of 8

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Question	Answer	Mark	Mark scheme	Additional guidance
9 (i)	$\frac{9}{22}$	B1	oe	If incorrect notation used in both (i) and (ii), penalise once only in (i)
(ii)	$\frac{14}{22}$	B1	oe eg $\frac{7}{11}$	
(iii)	0	B1		

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Question	Answer	Mark	Mark scheme	Additional guidance
10 (a)	cross at 0	B1	cao	<p>To fit “5” the “5” needs to be clearly stated as being the number of even numbers; otherwise accept 5 only; could be indicated alongside the given numbers.</p> <p>Could be written as a decimal (0.62, 0.625 or 0.63) or equivalent percentages to these</p>
(b)	cross at $\frac{1}{2}$	B1	cao	
(c)	$\frac{5}{8}$	M1	<p>for “5” where $a > “5”$ or $\frac{b}{8}$ where $b < 8$</p> <p>or for identifying all the even numbers, 2, 6 and 8</p> <p>or for writing the correct probability using the wrong notation eg 5 : 8</p>	
		A1	for $\frac{5}{8}$ oe	

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Question	Answer	Mark	Mark scheme	Additional guidance
11	No with reason	C1	<p>No with reason</p> <p>Acceptable reasons:</p> <p>(The sections are) not the same size or the angles are not the same</p> <p>(The arrow is) more likely to land on 1 or 3 than on 2</p> <p>(The probability for) 2 should be $\frac{1}{4}$</p> <p>2 has a 90° angle but 1 and 3 both have obtuse angles or 135° each</p> <p>2 has a 90° angle but the others are bigger</p> <p>2 has a smaller area</p> <p>(the sections have) different sizes/angles/areas</p> <p>(the spinner is) not split equally</p> <p>(the angle for) 2 would be 120 not 90</p> <p>(The angle for) 2 would be 120 or all angles would be 120</p> <p>(landing on) 2 is less than a third</p> <p>the chances for the other two are higher than (for) 2</p> <p>Not acceptable:</p> <p>Yes with any reason given</p> <p>No it should be $\frac{2}{3}$</p> <p>(No because) 2 has a 90° angle</p> <p>the bigger the angle the more likely</p>	

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Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	Unlikely	B1	cao	
(b)	Evens	B1	cao	

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Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	1	B1	Allow 100%	Allow $\frac{k}{k}$ Do not accept 100, do not accept certain.
(b)	$\frac{2}{3}$	P1	for start of process to write down proportion of each coin, writes down a correct ratio, eg 1p : 2p = 2 : 1 oe or a process to work out number of 1p coins and 2p coins, eg $40 \div 2 (= 20)$ and $(40 \div 2) \div 2 (= 10)$ or assigns numbers in correct proportion, eg 6 1p coins and 3 2p coins or finding the probability of a 2p coin $(= \frac{1}{3})$	
		A1	for $\frac{2}{3}$ oe	Accept any equivalent fraction, decimal form, 0.66(6...) or 0.67 or percentage form, 66(.6...) % or 67%

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Question	Answer	Mark	Mark scheme	Additional guidance
13 (a) (b)	$\frac{4}{15}$ 0.7	B1 B1	oe for 0.7 oe or $\frac{7}{10}$ oe or 70%	4 : 15 gets B0

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Question	Answer	Mark	Mark scheme	Additional guidance
15	Spinner (supported)	<p>P1</p> <p>P1</p> <p>C1</p>	<p>for a process to express one relationship, eg $\frac{2}{6}$ oe or $\frac{3}{8}$ oe or 2 : 4 oe or 3 : 5 oe or 2 : 6 oe or 3 : 8 oe</p> <p>for process to express both relationships, eg $\frac{2}{6}$ oe and $\frac{3}{8}$ oe or 2 : 4 oe and 3 : 5 oe or 2 : 6 oe and 3 : 8 oe</p> <p>for indicating (number greater than 5 on) spinner supported by correct values, eg $\frac{8}{24}$ and $\frac{9}{24}$ or 0.33(3..) and 0.37(5) or 33(.3..) % and 37(.5) % or 10 : 20 and 12 : 20 or 16 : 48 and 18 : 48</p>	<p>Allow use of words to describe relationship, eg 2 out of 6</p> <p>Conclusion may be indicated in body of question eg circling spinner or phrase</p>

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Question	Answer	Mark	Mark scheme	Additional guidance
16	Box B and correct figures	P1	for process to find one probability or proportion, eg $\frac{10}{10+30} \left(= \frac{10}{40} \right)$ or $\frac{7}{7+18} \left(= \frac{7}{25} \right)$	Accept 10 : 30 or 7 : 18
		P1	(dep P1) for process to find figures to compare using a common format, eg $10 \div [40] (= 0.25)$ and $7 \div [25] (= 0.28)$ or $10 \div [40] \times 100 (= 25)$ and $7 \div [25] \times 100 (= 28)$ or $\frac{10}{[40]} = \frac{25}{100}$ oe and $\frac{7}{[25]} = \frac{28}{100}$ oe or $\frac{10 \div 10}{[40] \div 10} \left(= \frac{1}{4} \right)$ and $\frac{7 \div 7}{[25] \div 7} \left(= \frac{1}{3.57\dots} \right)$	Accept eg 30 : 90 and 35 : 90 [40] is any value >10 [25] is any value >7 but one probability or proportion must be correct from previous P1
		C1	(dep on P2) for Box B and correct comparative figures, eg 0.25 and 0.28 or 25% and 28%	Comparative figures may be probabilities, ratios or comparative proportions eg box A: 70R and 210G and box B: 70R and 180G

June 2020 Paper 3

Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	$\frac{5}{11}$	M1 A1	for $\frac{5}{n}$ where $n > 5$ or $\frac{m}{11}$ where $m < 11$ for $\frac{5}{11}$ oe	where "11" comes from 5+2+4 Accept any equivalent fraction, decimal form 0.45(45...) or percentage form 45(.45...)%
(b)	0.7	B1	for 0.7 oe	Accept any equivalent fraction eg $\frac{7}{10}$ or percentage form eg 70%

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Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	$\frac{70}{100}$	M1	for $100 - 30 (= 70)$ or $\frac{30}{100}$ oe	Accept any equivalent fraction, decimal form 0.7 or percentage form 70%
		A1	for $\frac{70}{100}$ oe	
(b)	45	P1	for start to process, eg $30 \div 2 (= 15)$	
		A1	cao	If the reason is supported by numerical evidence then that evidence must be accurate. can ft (b) Note: if the answer to part (b) is an even number then 'yes' with supporting evidence is an acceptable answer
(c)	No with reason	C1	for No with reason or ft (b) Acceptable examples the number of red and yellow counters is an odd number 25 cannot be divided by 2 to give a whole number You can't have half a counter You can't split it evenly Not acceptable examples Yes they are in the ratio 2 : 3 one must be more than the other	

November 2024 Paper 1

Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	75	P1	<p>for process to find sum of unknown probabilities eg $1 - (0.10 + 0.30 + 0.05 + 0.25) (= 0.3)$ oe</p> <p>or for process to find number of times dice lands on 3, 4, 5 or 6 eg $(0.10 + 0.30 + 0.05 + 0.25) \times 500 (= 350)$ oe</p> <p>P1 for a complete process, eg $(“0.3” \div 2) \times 500$ oe</p> <p>or $(500 - “350”) \div 2$ oe</p> <p>A1 cao</p>	<p>Award mark for any two probabilities that sum to 0.3 eg in the table or probability of 2 = 0.15</p> <p>P1P1A0 for answer of 75:500 or $\frac{75}{500}$</p>
(b)	Answer to part (a) will be greater	C1	<p>for an explanation that the answer will be greater</p> <p>Acceptable examples It makes the answer an underestimate The number will be higher The answer will increase / will go up The number of 2’s will increase It would be more than [75]</p> <p>Not acceptable examples My answer will change My answer is incorrect The calculation will change The probability will change It would make the probability of 2 go up My answer won’t change</p>	<p>Where [75] is their answer to (a)</p>

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Question	Answer	Mark	Mark scheme	Additional guidance
21	80	M1 A1	for complete method, eg 200×0.4 or for $\frac{80}{200}$ for the answer cao	

June 2020 Paper 3

Question	Answer	Mark	Mark scheme	Additional guidance
21 (a)	25	B1	cao	
(b)	Simon with reason	C1	for Simon with reason Acceptable examples Simon; he uses more trials Simon; he does 10 times more Simon, since $100 > 10$ Simon because he threw it more frequently / often Simon since he has a larger range of results Not acceptable examples Paula Simon (unsupported) Simon because he threw it 100 times He gets more tails	If figures are given as part of the answer they must be correct

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Question	Answer	Mark	Mark scheme	Additional guidance
23	70	<p>P1</p> <p>P1</p> <p>P1</p> <p>A1</p>	<p>for process to find number of discs in the bag, eg $24 \div 0.16 (= 150)$ or for process to find the total probability of red or blue, eg $1 - 0.16 \left(= 0.84 \text{ or } \frac{21}{25} \text{ oe} \right)$</p> <p>for process to work with ratio, eg $([\text{total}] - 24) \div (5 + 4) (= 14)$ or for a process to find the probability of red, eg $[\text{probability}] \div (5 + 4) \times 5 \left(= 0.46\dots \text{ or } \frac{7}{15} \right)$</p> <p>for a complete correct process to find the number of red discs, eg “14” $\times 5$ or “0.46...” $\times 24 \div 0.16$ or an answer of $\frac{70}{150}$</p> <p>for 70</p>	<p>May be implied by 126</p> <p>0.46 or better or 0.47 may imply P2 [total] can be any integer [probability] can be any value less than 1</p> <p>If correct processes seen to find the total for both red and blue or 70 : 56 award P3 Must come from correct use of probability and ratio in either order</p> <p>If the values for red and blue are found, the value for red must be clearly identified as the answer to gain A1</p>

November 2021 Paper 3

Question	Answer	Mark	Mark scheme	Additional guidance
26 (a)	0.5, 0.3	P1	for $1 - 0.05 - 0.15 (=0.8)$	Award this mark for any two probabilities that sum to 0.8
		A1	oe	
(b)	120	M1	$18 \div 0.15$ oe or $6 + 18 + a + b$ where $a + b = 96$	
		A1	cao	