

1	24	P1	for start to process of working out the unknown probabilities, eg $1 - 0.32 - 0.20 (= 0.48)$ or assigning probabilities as $5x$ and x or process to work out the number of blue or green counters, eg $0.32 \times 300 (= 96)$ or $0.20 \times 300 (= 60)$ or $0.52 \times 300 (= 156)$	Award for $P(R) + P(Y) = 0.48$, may be seen in table
		P1	for process to find the probability, eg $5x + x = "0.48"$ or $"0.48" \div 6 (= 0.08)$ or process to find the number of red or yellow counters, eg $300 - "96" - "60"$ or $300 \times "0.48"$	
		A1	cao	
2	0.78	P1	for using 0.75 or 0.25 in a relevant product, eg $0.75 \times x$ or $0.25 \times y$	Allow different letters Could work with fractions Could set up an equation for $\text{pass} \times \text{pass} + \text{fail} \times \text{fail} = 0.64$ Accept 78% or any equivalent fraction, eg $\frac{39}{50}$, $\frac{156}{200}$
		P1	for using two products to form an equation, eg $0.75x + 0.25y = 0.36$	
		P1	for a correct equation in one variable, eg $0.75(1 - p) + 0.25p = 0.36$ or $0.75f + 0.25(1 - f) = 0.36$	
		A1	oe	
3	$\frac{11}{21}$	P1	for any product of 3 probabilities of the form $\frac{a}{9} \times \frac{b}{8} \times \frac{c}{7}$ where $a < 9, b < 8, c < 7$	May see fraction with denominator 504 Students who indicate they are using the approach $P(\text{even}) = 1 - P(\text{odd})$ should be given credit as appropriate Accept any equivalent fraction, decimal form 0.52(38...) or percentage form 52(.38...)%
		P1	for a product of 3 probabilities giving an even sum, eg. $E.E.E = \frac{4}{9} \times \frac{3}{8} \times \frac{2}{7}$ or $E.O.O = \frac{4}{9} \times \frac{5}{8} \times \frac{4}{7}$	
		P1	for summing the product of at least three correct triples, eg $(E.E.E + E.O.O + O.O.E =)$ $\frac{4}{9} \times \frac{3}{8} \times \frac{2}{7} + \frac{4}{9} \times \frac{5}{8} \times \frac{4}{7} + \frac{5}{9} \times \frac{4}{8} \times \frac{4}{7}$ OR $3(\frac{4}{9} \times \frac{5}{8} \times \frac{4}{7})$	
		A1	for $\frac{11}{21}$ oe SCB1 for answer of $\frac{364}{729}$ (replacement)	
4	(a) $\frac{1}{16}$	M1	for method to find probability of getting a score of 5, eg $\frac{10}{6+8+9+7+10} (= \frac{10}{40})$ oe	Accept any equivalent fraction, decimal form 0.06(25) or 0.063, percentage form 6(.25)% or 6.3% Ignore subsequent incorrect attempts to write the correct answer in a different form.
		A1	for $\frac{1}{16}$ oe	
	(b) 15	M1	for method to find the proportion of 1s, eg $\frac{6}{40}$ oe	
		A1	cao	

5	$\frac{62}{110}$	<p>P1</p> <p>P1</p> <p>A1</p> <p>OR</p> <p>P1</p> <p>P1</p> <p>A1</p> <p>SC B1 for answer of $\frac{62}{121}$ (replacement)</p>	<p>for process to find a probability of 2 cards of different colours, eg $\frac{3}{11} \times \frac{7}{10}$ or $\frac{3}{11} \times \frac{1}{10}$ or $\frac{7}{11} \times \frac{3}{10}$ or $\frac{7}{11} \times \frac{1}{10}$ or $\frac{1}{11} \times \frac{3}{10}$ or $\frac{1}{11} \times \frac{7}{10}$ oe or $\frac{3}{11} \times \frac{8}{10}$ oe or $\frac{7}{11} \times \frac{4}{10}$ oe or $\frac{1}{11} \times \frac{10}{10}$ oe</p> <p>for a complete process, eg $\frac{3}{11} \times \frac{7}{10} + \frac{3}{11} \times \frac{1}{10} + \frac{7}{11} \times \frac{3}{10} + \frac{7}{11} \times \frac{1}{10} + \frac{1}{11} \times \frac{3}{10} + \frac{1}{11} \times \frac{7}{10}$ oe or $\frac{3}{11} \times \frac{8}{10} + \frac{7}{11} \times \frac{4}{10} + \frac{1}{11} \times \frac{10}{10}$ oe</p> <p>for $\frac{62}{110}$ oe</p> <p>OR</p> <p>for process to find a probability of 2 cards of the same colour, eg $\frac{3}{11} \times \frac{2}{10}$ or $\frac{7}{11} \times \frac{6}{10}$ or $\frac{1}{11} \times \frac{0}{10}$ oe</p> <p>for a complete process, eg $1 - \frac{3}{11} \times \frac{2}{10} - \frac{7}{11} \times \frac{6}{10} - \left(\frac{1}{11} \times \frac{0}{10} \right)$ oe</p> <p>for $\frac{62}{110}$ oe</p> <p>SC B1 for answer of $\frac{62}{121}$ (replacement)</p>	<p>May see fraction with denominator 110</p> <p>Accept equivalent fraction, decimal form 0.56(36...) or percentage form 56(.36...)%</p> <p>Accept equivalent fraction, decimal form 0.56(36...) or percentage form 56(.36...)%</p>
6	(a) 0.7 0.65, 0.65 (b) 0.105	<p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>for 0.7 on the first branch</p> <p>for 0.65, 0.65 on the second branches</p> <p>for 0.3×0.35</p> <p>oe</p>	<p>Accept equivalent fractions or percentages for probabilities</p>
7	16	<p>P1</p> <p>P1</p> <p>A1</p>	<p>for Prob(R or G) = $1 - 0.4 (= 0.6)$</p> <p>or for (number of red or green counters) = $50 - 0.4 \times 50 (= 30)$</p> <p>or for use of ratio, eg [probability] $\times \frac{8}{15} (= 0.32)$ or [number of counters] $\times \frac{8}{15}$</p> <p>for a complete process to find number of green counters, eg $(1 - 0.4) \times \frac{8}{15} \times 50$</p> <p>or for $\frac{16}{50}$</p> <p>cao</p>	<p>[probability] may be 0.4 or 0.6 [number of counters] may be 20 or 50</p>
8	(a) $\frac{225}{3600}$ (b) Explanation	<p>P1</p> <p>P1</p> <p>A1</p> <p>C1</p>	<p>for process to use relative frequency for landing on a 6, eg $\frac{15}{60}$ oe</p> <p>for $\frac{15}{60} \times \frac{15}{60}$ oe, eg $\frac{1}{4} \times \frac{1}{4}$</p> <p>for $\frac{225}{3600}$ oe, eg $\frac{1}{16}$</p> <p>for a correct explanation</p> <p>Acceptable examples n must be greater than 60 She must do it more times than in (a) n must be bigger, eg 100</p> <p>Not acceptable examples If you increase the number of results, you increase the accuracy n must be bigger n is an integer n is 100</p>	<p>Accept any equivalent fraction, decimal form 0.06(25) or 0.062 or 0.063, percentage form 6(.25)% or 6.2% or 6.3%</p> <p>Ignore subsequent attempts to write the correct answer in a different form.</p>

9	$\frac{5x^2-23x+50}{9x^2-3x}$	<p>P1</p> <p>P1</p> <p>P1</p> <p>P1</p> <p>A1</p>	<p>for using $y = 3x$ or $x = \frac{1}{3}y$ to obtain an expression for a probability in one variable</p> <p>for a correct second probability eg $\frac{x-1}{y-1}$ or $\frac{x-1}{3x-1}$ or $\frac{4}{y-1}$ or $\frac{4}{3x-1}$ or $\frac{y-x-6}{y-1}$ or $\frac{2x-6}{3x-1}$</p> <p>for forming a correct product eg $\frac{x}{y} \times \frac{x-1}{y-1}$ or $\frac{x}{3x} \times \frac{x-1}{3x-1}$ or $\frac{5}{y} \times \frac{4}{y-1}$ or $\frac{5}{3x} \times \frac{4}{3x-1}$ or $\frac{y-x-5}{y} \times \frac{y-x-6}{y-1}$ or $\frac{2x-5}{3x} \times \frac{2x-6}{3x-1}$</p> <p>for adding the 3 correct probabilities eg $\frac{x}{y} \times \frac{x-1}{y-1} + \frac{5}{y} \times \frac{4}{y-1} + \frac{y-x-5}{y} \times \frac{y-x-6}{y-1}$ or $\frac{x}{3x} \times \frac{x-1}{3x-1} + \frac{5}{3x} \times \frac{4}{3x-1} + \frac{2x-5}{3x} \times \frac{2x-6}{3x-1}$</p> <p>$\frac{5x^2-23x+50}{9x^2-3x}$</p>	<p>This may be awarded at any time</p> <p>Can be seen after processing of algebra</p>
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