

Tree Diagrams (Probability) Mark Scheme

<p>1(a)</p>		
	<p>Complete tree diagram with correct probabilities</p>	<p>[2] mark for first flip correct and second mark for all correct</p>
<p>1(b)</p>	$P(H, H) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$	<p>[1] Probability two consecutive heads</p>
<p>2(a)</p>		
	<p>Complete tree diagram with correct probabilities</p>	<p>[2] mark for hurdles and Javelin</p>
<p>2(b)</p>	$0.6 \times 0.5 = 0.3 \text{ OR } 0.4 \times 0.4 = 0.16$	<p>[1] Probability of one win OR one lose</p>
	$0.3 + 0.16 = 0.46$	<p>[1] Final probability</p>

Turn over ►

3(a)	<p>Maths Homework</p> <p>English Homework</p>	$\frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$ $\frac{1}{3} \times \frac{3}{4} = \frac{3}{12} = \frac{1}{4}$ $\frac{2}{3} \times \frac{1}{4} = \frac{2}{12} = \frac{1}{6}$ $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$
	Completed tree diagram	[3] A mark for each section of the tree
3(b)	Ben completes both pieces of homework $\frac{1}{12}$	[1]
3(c)	Ben completes exactly one piece of homework $= \frac{1}{4} + \frac{1}{6} = \frac{5}{12}$	[2] a mark for working and one for answer
4(a)		$\frac{6}{10} \times \frac{5}{9} = \frac{1}{3}$ $\frac{6}{10} \times \frac{4}{9} = \frac{4}{15}$ $\frac{4}{10} \times \frac{6}{9} = \frac{4}{15}$ $\frac{4}{10} \times \frac{3}{9} = \frac{2}{15}$
	Completed tree diagram	[2]
4(b)	$P(-1 \text{ Blue} \ \& \ -1 \text{ Yellow}) = \frac{4}{15} + \frac{4}{15} = \frac{8}{15}$	[2] a mark for working and one for answer

Turn over ►

5(a)		
	Completed tree diagram	[3]
5(b)	<p>One red and one green ball are drawn</p> $= \frac{30}{110} + \frac{30}{110} = \frac{60}{110} = \frac{6}{11}$	[2] a mark for working and one for answer
5(c)	<p>Using answer from part (b),</p> $P(\text{same colour}) = 1 - P(\text{different colour})$ $P(\text{same colour}) = 1 - \frac{6}{11} = \frac{5}{11}$	<p>[1] Allow calculation of P(both red) and P(both green) and use of 'or rule'</p> <p>[1] Correct final answer</p>
6	<p>Probability of blue ball first: 8 blue balls and x balls in total</p> $\frac{8}{x}$ <p>Probability of choosing a green ball after a ball isn't replaced: 3 green balls $x - 1$ balls left in the bag.</p> $\frac{3}{x}$ <p>Probabilities are independent, so multiply to find the probability of both happening, which is equal to $\frac{1}{10}$.</p> $\frac{8}{x} \times \frac{3}{x-1} = \frac{1}{10}$ $\frac{24}{x(x-1)} = \frac{1}{10}$ $240 = x(x-1)$ $240 = x^2 - x$ $x^2 - x - 240 = 0$ $(x-16)(x+15) = 0$ $x = 16 \text{ or } x = -15$ <p>Can't have a negative number of balls in a bag, so there are 16 in total.</p>	<p>[1] Blue and green probabilities given in algebra form.</p> <p>[1] Setting up of equation</p> <p>[1] Correct manipulation into quadratic form</p> <p>[1] Factorising</p> <p>[1] Correct answer</p>

END