1	(a)		0.4,0.6	B1	correctly placing probs for light A eg 0.4, 0.6	
			0.3,0.7,0.8,0.2	B1	correctly placing probs for light B eg 0.3, 0.7, 0.8, 0.2	
	(b)		B with correct	P1	(ft) eg 0.4 × 0.3 or 0.6 × 0.8 or 1−(0.28+0.12)	
			probabilities	P1	both sets of correct probability calculations	
				C1	Correct interpretation of results with correct comparable results	

| 2 | (a) | | comment | C1 | for comment e.g. incorrect denominator for the 2nd student or probabilities for 2nd student do not add up to 1 | |
| | (b) | | No (supported) | C1 | for "no" with supporting evidence, e.g. probabilities should be multiplied together or 0.4 × 0.25 | |

3			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 ÷ "0.15" (= 160)	
				A1	cao	

4	(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 × "0.33" (=0.1485) **or** "0.55" × "0.35" (=0.1925) or 0.45 × "0.67" (=0.3015) **or** "0.55" × "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 × "0.33") + ("0.55" × "0.35") or 1 − (0.45 × "0.67") − ("0.55" × "0.65")	
			A1	answer in range 0.34 – 0.341 oe	

| 5 | | Probabilities should sum to 1 | C1 | for stating that the probabilities should total 1 eg 0.25 should be 0.35 | |
| | | 0.35 and 0.65 reversed | 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" | Can be shown on the diagram |

6	(a)	Diagram completed 0.85 0.15, 0.85, 0.15, 0.85	M1	for 1 − 0.15 (=0.85)	
			A1	fully correct diagram	
	(b)	0.2775	M1	for one correct product eg 0.15 × 0.15 (= 0.0225) or 0.15 × 0.85 (= 0.1275) or 0.85 × 0.85 (= 0.7225)	ft their diagram provided probabilities are less than 1
			M1	for a complete method eg "0.0225" + 2×"0.1275" **OR** 1 − "0.7225" oe	ft their diagram provided probabilities are less than 1
			A1	oe, eg $\frac{111}{400}$	

7		0.1709	M1	for one product, 0.07 × 0.98 (=0.0686) **or** 0.93 × 0.11 (=0.1023) **or** 0.07 × 0.02 (=0.0014) **or** 0.93 × 0.89 (= 0.8277)	If all products shown, award this mark
			M1	for a fully correct method, eg 0.07 × 0.98 + 0.93 × 0.11 or 1 − (0.07 × 0.02) − (0.93 × 0.89)	
			A1	oe	

8	$\dfrac{180}{336}$	P1	for $\dfrac{3}{7}$ or $\dfrac{4}{7}$ or $\dfrac{5}{7}$ as probability for second counter	May be seen in a calculation or on a diagram
		P1	for one correct product eg $\dfrac{3}{8}\times\dfrac{5}{7}\times\dfrac{4}{6}$ $(=\dfrac{60}{336})$ or $\dfrac{5}{8}\times\dfrac{3}{7}\times\dfrac{4}{6}$ $(=\dfrac{60}{336})$ or $\dfrac{5}{8}\times\dfrac{4}{7}\times\dfrac{3}{6}$ $(=\dfrac{60}{336})$	
		P1	for a complete process eg $\dfrac{3}{8}\times\dfrac{5}{7}\times\dfrac{4}{6} + \dfrac{5}{8}\times\dfrac{3}{7}\times\dfrac{4}{6} + \dfrac{5}{8}\times\dfrac{4}{7}\times\dfrac{3}{6}$	
		A1	oe, eg $\dfrac{15}{28}$ SC B1 for answer of $\dfrac{225}{512}$ (replacement)	Accept equivalent fractions, decimals (0.53... or 0.54) or percentages (53% or 54%)

9	0.748	P1	for a process to find a correct probability product for 2 consecutive days, eg. 0.7 × 0.8 (rain M + T) or 0.7 × 0.2 (rain M + no rain T) or 0.3 × 0.6 (no rain M + rain on T) or 0.3 × 0.4 (no rain M + T)	Throughout accept probabilities given as fractions or percentages Could be for Tuesday and Wednesday also
		P1	for process to find a correct triple probability product for it raining on Wednesday, eg. 0.7 × 0.8 × 0.8 (rain M + T + W) (= 0.448 or $\dfrac{56}{125}$ oe) or 0.7 × 0.2 × 0.6 (rain M + no rain T + rain W) (= 0.084 or $\dfrac{21}{250}$ oe) or 0.3 × 0.6 × 0.8 (no rain M + rain T + rain W) (= 0.144 or $\dfrac{18}{125}$ oe) or 0.3 × 0.4 × 0.6 (no rain M + no rain T + rain W) (= 0.072 or $\dfrac{9}{125}$ oe)	
		P1	for complete process, eg. "0.448" + "0.084" + "0.144" + "0.072"	
		A1	oe eg, $\dfrac{187}{250}$	NB: correct answer without supportive working gets 0 marks