

Topic 11 Probability (Pre-TT) [44] MARKSCHEME

1.

$$\frac{3}{8} \text{ or } \frac{2}{8} \text{ or } \frac{1}{8}$$

M1

Any correct probability seen

$$x (<7) \div 7$$

M1 dep

Use of 7 in second denominator

$$\left(\frac{3}{8} \times \frac{5}{7}\right) \text{ or } \left(\frac{2}{8} \times \frac{6}{7}\right) \text{ or } \left(\frac{1}{8} \times 3\right)$$

M1 dep

Any one correct product

$$\left(\frac{3}{8} \times \frac{5}{7}\right) \text{ or } \left(\frac{2}{8} \times \frac{6}{7}\right) \text{ or } \left(\frac{1}{8} \times 3\right)$$

M1 dep

For addition of 3 correct products

Alternate method:

$$\frac{3}{8} \text{ or } \frac{2}{8}$$

$$\frac{x}{7}$$

$$\frac{3}{8} \times \frac{1}{7} \text{ or } \frac{3}{8} \times \frac{2}{7}$$

$$1 - \left(\frac{2}{8} \times \frac{1}{7} + \frac{3}{8} \times \frac{2}{7}\right) \text{ or addition method}$$

1 - [P(AA) + P(EE)] or 20 correct added (Complete method)

$$\frac{6}{7} \text{ or } 0.86\dots$$

A1

[5]

2.

(a) 14

M1,A1

M1 for 0.28×50

A1 cao

(b) 0.3

B1

(c) biased, should be nearer 0.5

B1

[4]

3.

Starter and main 8×12 Main and dessert 12×6 Three courses $8 \times 12 \times 6$ $96 + 72 + 576 = 744$	3 1 AO1.3b 1 AO2.1a 1 AO2.2	M1 for one correct product M1 for summing <i>their</i> three products	
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4.

(a) Complete tree correct

B1

(b) 0.44

M1,A1,A1 cao

M1 for product of probs.

A1 for $0.6 \times 0.2 + 0.4 \times 0.8$ ft their tree

A1 answer

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5.

(a) All 3 missing probabilities correctly filled in B1

(b) 0.7×0.4 or 0.6×0.3 M1

ft from unambiguous tree diagram except if 0.5 used

Either seen in (b) or 0.28 or 0.18

“0.28” + “0.18” M1

Adding the 2 “correct” products

If no working in (b) answer can follow tree diagram if fully

correct to answer in (b) \Rightarrow M1 M1

** Working in (b) can be ft from incorrect tree diagram as long as it is not ambiguous (\Rightarrow M1M1A0)*

= 0.46 A1

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6.

0.49	P1 for $\sqrt{0.09}$ P1 for $(1 - \sqrt{0.09})^2$ A1 cao
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7.

$(\frac{1}{4} \times \frac{1}{4} \times \frac{3}{4})$ or $(\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4})$ M1

Either triple product

$(\frac{1}{4} \times \frac{1}{4} \times \frac{3}{4}) \times 3$ M1

$(\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}) \times 4$ or $(\frac{1}{4} \times \frac{1}{4} \times \frac{3}{4}) \times 4$ M1

Note $\frac{1}{4} \times \frac{1}{4} \times \frac{3}{4} \times 12 \rightarrow M3$

$(\frac{1}{4} \times \frac{1}{4} \times \frac{3}{4}) \times 3 \times 4 + (\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}) \times 4$ M1

= $\frac{5}{8}$ A1

Alternative method

$(\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4})$ M1

$(\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}) \times 4 \times 3 \times 2$ M2

$1 - (\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}) \times 4 \times 3 \times 2$ M1 dep

= $\frac{5}{8}$ A1

[5]

8.

(a)	0.16 + 0.24 + 0.16 + 0.24 or 0.8(0)	M1	
	0.2	A1	oe
(b)	0.4(0)	B1	
Alternative method 1			
	4 ÷ 0.16 or 1 number ↔ 0.04	M1	oe
	25	A1	oe
(c)	Alternative method 2		
	$\frac{0.24}{0.16} \times 4$ or 6 or $\frac{\text{their } x}{0.16} \times 4$ or 5	M1	oe Attempt to work out how many prime numbers in the range $361 \leq n < 390$ or $421 \leq n < 450$ or $331 \leq n < 360$
	25	A1	

9.

$$\frac{6}{10} \times \frac{4}{10} \times \frac{4}{10} \times \frac{3}{9}$$

First product correct M1
Second product correct M1

$$= \frac{24}{100} + \frac{12}{90}$$

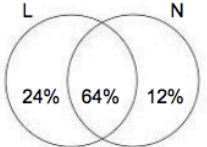
$0.24 + 0.13$ M1 dep

$$= \frac{28}{75}$$

0.37 (or better) A1

[4]

10.

(a)		3 1 AO2.3a 2 AO2.3b	B1 for 24% in L and B1 for 12% in N and M1 for 100 – (their '12' + their '24') in overlap	Condone universal set missing
(b)	(i) $\frac{64}{88}$ oe	2 2 AO1.3a	M1 for 64 or 88	FT their Venn diagram
	(ii) $\frac{24}{36}$ oe	2 2 AO1.3a	M1 for 24 or 36	FT their Venn diagram