

Q1. 2017

A)

450 in Drink coffee Yes	B1	
50 in Drink coffee No	B1ft	ft 500 – their 450
90 in At least three cups Yes	B1ft	ft their 450 ÷ 5
360 in At least three cups No	B1ft	ft their 450 – their 90
Additional Guidance		
for 90 ft, their 450 ÷ 5 must be truncated or rounded up to the nearest whole number		
for 360 ft, their 450 – their 90 must give a positive integer		
Accept unambiguous values elsewhere but diagram values take precedence		
Correct relative frequencies seen, withhold first B1 that would have been awarded. eg $\frac{400}{500}, \frac{100}{500}, \frac{80}{400}, \frac{320}{400}$		B0 B0ft B1ft B1ft
eg $\frac{400}{500}, \frac{100}{500}, \frac{80}{500}, \frac{320}{500}$		B0 B0ft B0ft B0ft
Do not accept probabilities eg $\frac{9}{10}, \frac{1}{10}, \frac{4}{5}, \frac{1}{5}$ eg 0.9, 0.1, 0.8, 0.2		B0 B0

B)

Alternative method 1		
their 90 500 (or partially simplified)	B1ft	oe eg decimal ft or correct
$\frac{9}{50}$	B1ft	ft their unsimplified fraction fully simplified $\frac{9}{50}$ scores B1B1
Alternative method 2		
$\frac{9}{10} \times \frac{1}{5}$	M1	oe eg 0.9×0.2 or 0.18
$\frac{9}{50}$	A1	
Additional Guidance		
$\frac{90}{500} = \frac{18}{100}$		B1B0
$\frac{80}{500} = \frac{4}{25}$ (with 80 in part(a) then ft)		B1ftB1ft
$\frac{80}{500} = \frac{4}{25}$ (with 80 not in part (a) so not ft but then simplest form correct)		B0B1ft
$\frac{80}{500} = \frac{8}{50}$ (with 80 not in part (a) so not ft and simplest form not correct)		B0B0
$\frac{45}{250}$		B1B0
80 in (a), $\frac{8}{50}$ here		B1B0
$\frac{90}{400} = \frac{9}{40}$		B0B1ft
$\frac{500}{90} = \frac{50}{9}$		B0B1ft
Do not accept 18% for first mark		

Q3. (2017)

14

A number is picked at random from the first four **prime** numbers.
A number is picked at random from the first four **square** numbers.
The two numbers are added to get a score.

A)

14(a)	16 in top row	B1				
	5 in left column	B1				
	All totals correct or All totals correct including for their 16 and their 5	B2ft	B1ft for seven or more correct totals for the given numbers and their 16 and their 5 (if present) If their 16 is 0, 1, 4 or 9, do not consider those totals If their 5 is 0, 2, 3 or 7, do not consider those totals			
	Additional Guidance					
Fully correct table						
	÷	1	4	9	16	B4
	2	3	6	11	18	
	3	4	7	12	19	
	5	6	9	14	21	
	7	8	11	16	23	

B)

14(b)	<u>their correct number of primes</u> their number of completed cells $\frac{6}{16}$ or $\frac{3}{8}$ if (a) fully correct	B1ft	oe ft their table even if incomplete but must be attempted																								
	Additional Guidance																										
	Correct decimal and percentage values are 0.375 and 37.5% Do not accept truncated or rounded values unless the correct value has been seen Do not accept ratios or words																										
	<table border="1"> <tr> <td>÷</td> <td>1</td> <td>4</td> <td>9</td> <td></td> </tr> <tr> <td>2</td> <td>3</td> <td>6</td> <td>11</td> <td></td> </tr> <tr> <td>3</td> <td>4</td> <td>7</td> <td>12</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>8</td> <td>11</td> <td>16</td> <td></td> </tr> </table>	÷	1	4	9		2	3	6	11		3	4	7	12							7	8	11	16		Answer $\frac{4}{9}$
÷	1	4	9																								
2	3	6	11																								
3	4	7	12																								
7	8	11	16																								

Q4. (2019)

21 Anna plays a game with an ordinary, fair dice.

If she rolls 1 she wins.

If she rolls 2 or 3 she loses.

If she rolls 4, 5 or 6 she rolls again.

When she has to roll again,

if she rolls an odd number she wins

if she rolls an even number she loses.

(A)

21(a)	$\frac{1}{6}$ on '1' and $\frac{1}{3}$ or $\frac{2}{6}$ on '2 or 3' and $\frac{1}{2}$ on each of 'Odd' and 'Even'	B2	oe fraction, decimal or percentage B1 $\frac{1}{6}$ on '1' and $\frac{1}{3}$ or $\frac{2}{6}$ on '2 or 3' or $\frac{1}{2}$ on each of 'Odd' and 'Even' or all correct unsimplified probabilities with one or more simplification errors eg $\frac{3}{6}$ on 'Odd' simplified to $\frac{1}{2}$
	Additional Guidance		
	Accept decimals or percentages rounded or truncated correctly to at least 2 significant figures		
	Only withhold a mark for simplification errors if B2 would otherwise be awarded		
	Ignore extra branches added		
	Ignore attempts to work out combined probabilities to the right of the tree diagram		
	If an answer line is blank, the student may have written their answer elsewhere on the branch		

(B)

21(b)	Alternative method 1: $P(1) + P(4, 5 \text{ or } 6) \times P(\text{Odd})$		
	$\frac{1}{2} \times \text{their } \frac{1}{2} \text{ or } \frac{1}{4}$	M1	oe
	their $\frac{1}{4}$ + their $\frac{1}{6}$	M1dep	oe
	$(P(\text{win}) =) \frac{10}{24} \text{ or } \frac{5}{12}$	A1ft	oe ft their tree diagram
	Lose (and $P(\text{Lose}) = \frac{14}{24} \text{ or } \frac{7}{12}$ oe)	A1ft	ft correct decision for their $\frac{5}{12}$ (and their $\frac{7}{12}$) with M2 scored
	Alternative method 2: $1 - P(2 \text{ or } 3) - P(4, 5 \text{ or } 6) \times P(\text{Even})$		
	$\frac{1}{2} \times \text{their } \frac{1}{2} \text{ or } \frac{1}{4}$	M1	oe
	their $\frac{1}{4}$ + their $\frac{1}{3}$ or $P(\text{lose}) = \frac{7}{12}$	M1dep	oe ft their tree diagram
	$(P(\text{win}) =) \frac{10}{24} \text{ or } \frac{5}{12}$	A1ft	oe ft their tree diagram
	Lose (and $P(\text{Lose}) = \frac{14}{24} \text{ or } \frac{7}{12}$ oe)	A1ft	ft correct decision for their $\frac{5}{12}$ (and their $\frac{7}{12}$) with M2 scored
	Additional Guidance is on the following page		