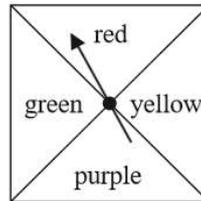


DO NOT WRITE IN THIS AREA

1 Here is a biased spinner.



When the spinner is spun once, the probabilities that it lands on red or on yellow or on green are given in the table.

Colour	red	yellow	purple	green
Probability	0.25	0.2		0.2

(a) Work out the probability that the spinner lands on red or on yellow.

$$\begin{aligned}
 P(\text{Red or yellow}) &= P(\text{Red}) + P(\text{yellow}) \\
 &= 0.25 + 0.2 \\
 &= 0.45
 \end{aligned}$$

.....
(1)

Yang is going to spin the spinner 300 times.

(b) Work out an estimate for the number of times the spinner will land on purple.

Probability must add up to 1

$$\begin{aligned}
 P(\text{purple}) &= 1 - 0.25 - 0.2 - 0.2 \\
 &= 0.35
 \end{aligned}$$

$$\begin{aligned}
 \text{Estimated purple} &= 300 \times 0.35 \\
 &= 105
 \end{aligned}$$

.....
(3)

(Total for Question 1 is 4 marks)

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DO NOT WRITE IN THIS AREA

- 1 A tin contains tea bags with a choice of four different flavours of tea. The four flavours of tea are Assam or Darjeeling or Nilgiri or Rize.

Sara takes at random a tea bag from the tin.

The table shows each of the probabilities that the flavour of the tea Sara takes is Assam or Darjeeling or Rize.

Flavour of tea	Assam	Darjeeling	Nilgiri	Rize
Probability	0.38	0.24		0.16

- (a) Work out the probability that the flavour of the tea Sara takes is Nilgiri.

Probability must equal 1

$$P(\text{Nilgiri}) = 1 - 0.38 - 0.24 - 0.16$$

$$= 0.22$$

.....
(2)

- (b) Work out the probability that the flavour of the tea Sara takes is either Darjeeling or Rize.

$$P(\text{Darjeeling or Rize}) = P(\text{Darjeeling}) + P(\text{Rize})$$

$$= 0.24 + 0.16$$

$$= 0.4$$

.....
(2)

(Total for Question 1 is 4 marks)

DO NOT WRITE IN THIS AREA



P 6 8 7 2 9 A 0 3 3 2

- 2 A biased spinner can land on green or on yellow or on brown or on pink.

The table gives the probabilities that, when the spinner is spun, it will land on green or on yellow or on brown.

Colour	green	yellow	brown	pink
Probability	0.32	0.13	0.28	

Timucin spins the spinner 200 times.

Work out an estimate for the number of times the spinner lands on pink.

$$1 - 0.32 - 0.13 - 0.28$$

$$P(\text{pink}) = 0.27$$

$$\begin{aligned} \text{Estimated pink} &= 200 \times 0.27 \\ &= 54 \end{aligned}$$

(Total for Question 2 is 3 marks)

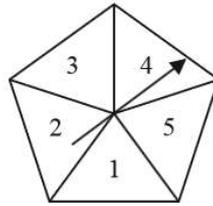
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2 Here is a biased spinner.



The table gives information about the probability that, when the spinner is spun once, it will land on each number.

Number	1	2	3	4	5
Probability	$2x$	0.27	0.04	x	0.12

Alexis is going to spin the spinner 400 times.

Work out an estimate for the number of times the spinner will land on an odd number.

Probability = 1

$$2x + 0.27 + 0.04 + x + 0.12 = 1$$

$$3x + 0.43 = 1$$

$$\begin{array}{r} -0.43 \quad -0.43 \\ 3x + 0.43 = 1 \\ \hline 3x = 0.57 \end{array}$$

$$3x = 0.57$$

$$\div 3$$

$$\div 3$$

$$x = 0.19$$

odds are 1 3 5

$$2(0.19) + 0.04 + 0.12$$

$$= 0.54$$

400 spins 0.54×400

(Total for Question 2 is 4 marks)

$$= 216$$

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DO NOT WRITE IN THIS AREA



- 2 450 students were asked how they travelled to school on Monday.
 Each student walked or travelled by bus or travelled by car or travelled by bicycle.
 Each student used just one method of travel.

One of these students is chosen at random.
 The table shows information about the probability of each method of travel.

Method of travel	walk	bus	car	bicycle
Probability	0.20	x	$2x$	0.26

Work out how many of the 450 students travelled by car.

$$0.20 + x + 2x + 0.26 = 1$$

$$\begin{array}{r}
 3x + 0.46 = 1 \\
 - 0.46 - 0.46 \\
 \hline
 3x = 0.54 \\
 \div 3 \\
 \hline
 x = 0.18
 \end{array}$$

$$\begin{array}{l}
 \text{car} = 2(0.18) \\
 = 0.36
 \end{array}$$

$$450 \times 0.36 = 162$$

(Total for Question 2 is 4 marks)

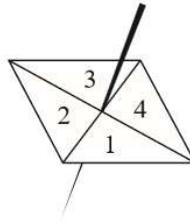
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2 Here is a biased 4-sided spinner.



The table gives the probabilities that, when the spinner is spun once, it will land on 1 or it will land on 3

Number	1	2	3	4
Probability	0.26	x	0.18	x

The probability that the spinner will land on 2 is equal to the probability that the spinner will land on 4

Ravina is going to spin the spinner a number of times.

Ravina works out that an estimate for the number of times the spinner will land on 3 is 45

Work out an estimate for the number of times the spinner will land on 4

$$0.26 + x + 0.18 + x = 1$$

$$2x + 0.44 = 1$$

$$\begin{array}{r} -0.44 \\ -0.44 \\ \hline = 0.56 \end{array}$$

$$2x$$

$$\div 2$$

$$x$$

$$= 0.56$$

$$\div 2$$

$$= 0.28$$

Lands on 3

$$0.18 = 45$$

$$\div 18 \rightarrow 0.01 = 2.5 \quad \div 18$$

$$\times 100 \rightarrow 1.00 = 250 \quad \times 100$$

250 people in total

Land on 4

$$0.28 \times 250 = 70$$

(Total for Question 2 is 4 marks)

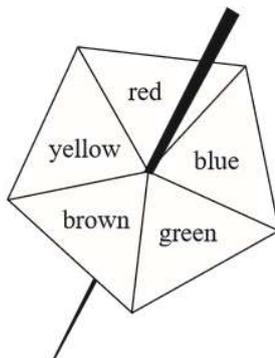
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3 Here is a biased 5-sided spinner.



When the spinner is spun, it can land on red, blue, green, brown or yellow.

The table gives the probabilities that the spinner lands on red or on blue or on green.

Colour	red	blue	green	brown	yellow
Probability	0.15	0.26	0.33	$x + 0.06$	x

= 1

When the spinner is spun once, the probability that the spinner lands on brown is 0.06 more than the probability that the spinner lands on yellow.

Jenine spins the spinner 150 times.

Work out an estimate for the number of times the spinner lands on yellow.

$$0.15 + 0.26 + 0.33 + x + 0.06 + x = 1$$

$$\begin{array}{r} 2x + 0.80 = 1 \\ -0.80 \quad -0.80 \\ \hline 2x = 0.2 \\ \div 2 \quad \div 2 \\ \hline x = 0.1 \end{array}$$

$$\begin{aligned} \text{Yellow} &= 0.1 \times 150 \\ &= 15 \end{aligned}$$

(Total for Question 3 is 4 marks)

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November 2023 P1H

- 4 A biased spinner has three sections each of a different colour.

The table shows the probability that, when the spinner is spun once, it will land on blue or on orange or on white.

Colour	blue	orange	white
Probability	0.58	2x	x

= 1

- (a) Work out the value of x

$$0.58 + 2x + x = 1$$

$$3x + 0.58 = 1$$

$$-0.58 \quad -0.58$$

$$3x = 0.42$$

$$\div 3$$

$$\div 3$$

$$x$$

$$= 0.14$$

x =

(2)

The spinner is spun 250 times.

- (b) Work out an estimate for the number of times the spinner will land on blue.

$$0.58 \times 250 = 145$$

.....
(2)

(Total for Question 4 is 4 marks)

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DO NOT WRITE IN THIS AREA



- 5 Cody has a biased 5-sided spinner, numbered 1, 2, 3, 4, 5

The table gives the probabilities that when the spinner is spun it will land on 2 or on 3 or on 5

Number	1	2	3	4	5	
Probability	x	0.14	0.17	x	0.21	$= 1$

The probability that the spinner will land on 1 is the same as the probability that the spinner will land on 4

Cody is going to spin the spinner 400 times.

Work out an estimate for the number of times the spinner will land on 4

$$x + 0.14 + 0.17 + x + 0.21 = 1$$

$$2x + 0.52 = 1$$

$$\quad -0.52 \quad -0.52$$

$$2x = 0.48$$

$$\div 2 \quad \div 2$$

$$x = 0.24$$

400 times on 4

$$0.24 \times 400 = 96$$

(Total for Question 5 is 4 marks)

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DO NOT WRITE IN THIS AREA



5 Becky has a biased 6-sided dice.

The table gives information about the probability that, when the dice is thrown, it will land on each number.

Number	1	2	3	4	5	6
Probability	$2x$	0.18	$2x$	$3x$	0.26	x

Becky is going to throw the dice 200 times.

Work out an estimate for the number of times that the dice will land on an even number.

$$2x + 0.18 + 2x + 3x + 0.26 + x = 1$$

$$8x + 0.44 = 1$$

$$8x \quad \begin{array}{r} -0.44 \\ -0.44 \end{array} = 0.56$$

$$\begin{array}{r} \div 8 \\ x \end{array} \quad \begin{array}{r} \div 8 \\ = 0.07 \end{array}$$

$$\begin{array}{l} \text{Even number} \quad \quad \quad 2 \quad \quad 4 \quad \quad 6 \\ \quad \quad \quad \quad \quad \quad 0.18 \quad + 3(0.07) + 0.07 \\ \quad \quad \quad \quad \quad \quad = 0.46 \end{array}$$

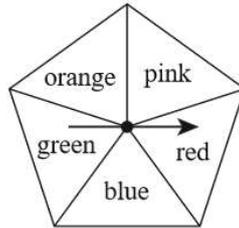
$$0.46 \times 200 = 92$$

(Total for Question 5 is 4 marks)



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6 Grace has a biased 5-sided spinner.



Grace is going to spin the arrow on the spinner once.

The table below gives the probabilities that the spinner will land on red or on blue or on green.

Colour	Red	Blue	Green	Orange	Pink	
Probability	0.20	0.12	0.08	3x	x	= 1

The probability that the spinner will land on orange is 3 times the probability that the spinner will land on pink.

(a) Work out the probability that the spinner will land on orange.

$$0.20 + 0.12 + 0.08 + 3x + x = 1$$

$$4x + 0.4 = 1$$

$$-0.4 \quad -0.4$$

$$= 0.6$$

$$\begin{array}{r} 4x \\ \div 4 \\ \hline x \end{array}$$

$$\div 4$$

$$= 0.15$$

$$\text{orange } 3(0.15) = 0.45$$

Grace spins the arrow on the spinner 150 times.

(b) Work out an estimate for the number of times the spinner lands on blue.

$$0.12 \times 150 = 18$$

(2)

(Total for Question 6 is 5 marks)

DO NOT WRITE IN THIS AREA



P 6 5 9 1 4 A 0 7 2 8

6 There are some ice lollies in a freezer.

The flavour of each ice lolly is banana or strawberry or mint or chocolate.

Julius takes at random an ice lolly from the freezer.

The table shows the probabilities that the flavour of the ice lolly that Julius takes is banana or strawberry or chocolate.

Flavour	banana	strawberry	mint	chocolate
Probability	0.35	0.32	x	0.12

= 1

Work out the probability that the flavour of the ice lolly that Julius takes is either strawberry or mint.

$$0.35 + 0.32 + x + 0.12 = 1$$

$$\begin{aligned}
 x + 0.79 &= 1 \\
 -0.79 \quad -0.79 \\
 x &= 0.21
 \end{aligned}$$

Strawberry or mint

(Total for Question 6 is 3 marks)

$$\begin{aligned}
 &= 0.32 + 0.21 \\
 &= 0.53
 \end{aligned}$$

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

- 6 A bag contains only red beads, blue beads, green beads and yellow beads.

The table gives the probabilities that, when a bead is taken at random from the bag, the bead will be blue or the bead will be yellow.

Colour	red	blue	green	yellow
Probability	x	0.24	$2x$	0.31

$= 1$

The probability that the bead will be green is twice the probability that the bead will be red.

Sofia takes at random a bead from the bag.

She writes down the colour of the bead and puts the bead back into the bag.

She does this 180 times.

Work out an estimate for the number of times she takes a red bead from the bag.

$$x + 0.24 + 2x + 0.31 = 1$$

$$3x + 0.55 = 1$$

$$\begin{array}{r} -0.55 \quad -0.55 \\ \hline = 0.45 \end{array}$$

$$\begin{array}{r} 3x \\ \div 3 \\ \hline x \\ = 0.15 \end{array}$$

$$\begin{aligned} \text{Red} &= 180 \times 0.15 \\ &= 27 \end{aligned}$$

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DO NOT WRITE IN THIS AREA

(Total for Question 6 is 4 marks)



January 2022 Paper 2H

- 6 A bag contains only pink sweets, white sweets, green sweets and red sweets.

The table gives each of the probabilities that, when a sweet is taken at random from the bag, the sweet will be green or the sweet will be red.

Sweet	pink	white	green	red
Probability	$2x$	x	0.2	0.35

$= 1$

The ratio

number of pink sweets : number of white sweets = 2 : 1

There are 28 red sweets in the bag.

Work out the number of white sweets in the bag.

$$2x + x + 0.2 + 0.35 = 1$$

$$3x + 0.55 = 1$$

$$-0.55 \quad -0.55$$

$$3x = 0.45$$

$$\div 3 \quad \div 3$$

$$x = 0.15$$

Red $0.35 = 28 \text{ sweets}$

$$\therefore \div 35$$

$$0.01 = 0.8$$

$$\times 100$$

$$1.00 = 80 \text{ sweets in the bag}$$

$$\text{White} = 0.15 \times 80$$

$$= 120$$

(Total for Question 6 is 5 marks)



DO NOT WRITE IN THIS AREA

7 Some members of a library were asked to name the type of book that they each liked to read the best.

One of the members is chosen at random.

The table shows information about the probability of the type of book that this member answered.

Type of book	comedy	romance	mystery	thriller
Probability	0.24	0.40	3x	x

= 1

48 members answered comedy books.

Work out how many of the members answered mystery books.

$$0.24 + 0.40 + 3x + x = 1$$

$$4x + 0.64 = 1$$

$$\begin{array}{r} -0.64 \quad -0.64 \\ 4x + 0.64 = 1 \\ \hline 4x = 0.36 \end{array}$$

$$4x = 0.36$$

$$\begin{array}{r} \div 4 \quad \div 4 \\ 4x = 0.36 \\ \hline x = 0.09 \end{array}$$

$$\text{Mystery} = 3(0.09) = 0.27$$

$$\begin{array}{l} 0.24 = 48 \text{ comedy books} \quad \downarrow \div 24 \\ \div 24 \downarrow \\ 0.01 = 2 \quad \downarrow \times 100 \\ \times 100 \downarrow \\ 1.00 = 200 \text{ total books} \end{array}$$

(Total for Question 7 is 4 marks)

$$\begin{aligned} \text{Mystery} &= 0.27 \times 200 \\ &= 54 \end{aligned}$$



P 7 2 4 3 7 R A 0 9 3 2

12 Moeen has a biased 6-sided dice.

The table gives information about the probability that, when the dice is thrown, it will land on each number.

Number	1	2	3	4	5	6
Probability	x	0.15	0.5	y	0.13	0.03

= 1

(a) Show that $x + y = 0.19$

$$\begin{aligned}
 x + 0.15 + 0.5 + y + 0.13 + 0.03 &= 1 \\
 x + y + 0.81 &= 1 \\
 x + y &= 0.19
 \end{aligned}$$

(2)

Given that $3x - y = 0.09$

and $x + y = 0.19$

(b) work out the value of x and the value of y
Show clear algebraic working.

$$\begin{aligned}
 3x - y &= 0.09 \\
 x + y &= 0.19 \quad (+) \\
 \hline
 4x &= 0.28 \\
 \div 4 &\quad \div 4 \\
 x &= 0.07
 \end{aligned}$$

$$\begin{aligned}
 x + y &= 0.19 \\
 0.07 + y &= 0.19 \\
 -0.07 &\quad -0.07 \\
 y &= 0.12
 \end{aligned}$$

$x = \dots\dots\dots$
 $y = \dots\dots\dots$

(3)

(Total for Question 12 is 5 marks)

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