

Probability

ANSWERS

Calculator | 30 minutes | Total marks: 31

Name

Class

- 1 A bag contains 4 yellow, 7 green and 9 white counters. A counter is taken at random.

(a) Work out the probability that the counter is green.

Answer $\frac{7}{20}$ (1)

[1 mark]

(b) Work out the probability that the counter is not white.

Answer $\frac{11}{20}$ (1)

[1 mark]

- 2 A spinner can land on red, blue, green or yellow. The table shows some of the probabilities.

	Red	Blue	Green	Yellow
Probability	0.15	0.3	0.2	

Work out the probability that the spinner lands on yellow.

Answer 0.35 (1)

[1 mark]

- 3 Kai throws a drawing pin and records how many times it lands point up.

Number of throws	20	50	100	200
Times point up	13	29	62	118

(a) Work out the best estimate of the probability that the pin lands point up.

uses the 200 throws: $118 \div 200$

Answer 0.59 (1)

[1 mark]

(b) The pin is thrown 1500 times. Estimate the number of times it lands point up.

0.59×1500

Answer 885 (1)

[1 mark]

- 4 Spinner A has the numbers 1, 2, 3 and 4. Spinner B has the numbers 2, 3 and 5. Both spinners are fair. Each is spun once and the two numbers are multiplied.

(a) Complete the table of products.

×	2	3	5
1	2	3	5
2	4	6	10
3	6	9	15
4	8	12	20

6, 10 and 12 (1)

[1 mark]

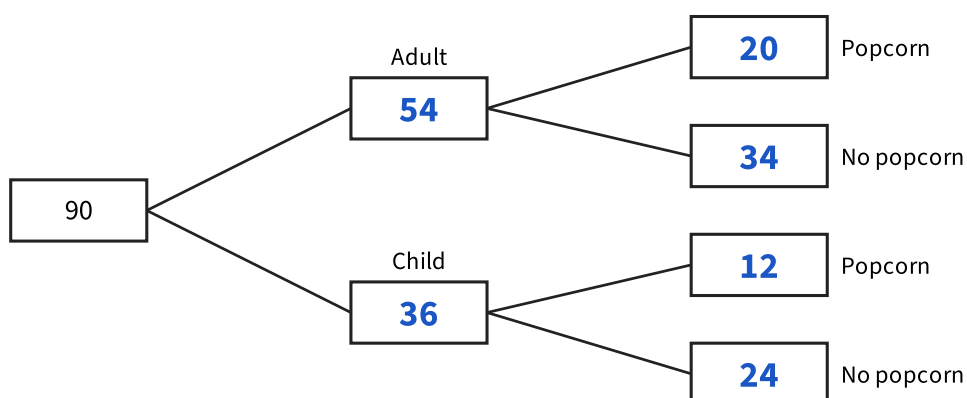
(b) Work out the probability that the product is a multiple of 4

Answer $\frac{4}{12}$ or $\frac{1}{3}$ (1)

[1 mark]

- 5 90 people watch a film. 54 of them are adults.
20 of the adults and 12 of the children buy popcorn.

(a) Complete the frequency tree.



54 and 36 (1)

20, 34, 12 and 24 (1)

[2 marks]

(b) One of the people is chosen at random. Work out the probability that this person buys popcorn.

$$20 + 12 = 32$$

Answer $\frac{32}{90}$ or $\frac{16}{45}$ (1)

[1 mark]

- 6 60 students choose a trip. The two-way table shows some information about their choices.

(a) Complete the two-way table.

	Theatre	Beach	Zoo	Total
Year 10	9	14	7	30
Year 11	8	12	10	30
Total	17	26	17	60

any three correct (1)

all five correct (1)

[2 marks]

(b) A student is chosen at random. Work out the probability that the student is in Year 11 and chose the zoo.

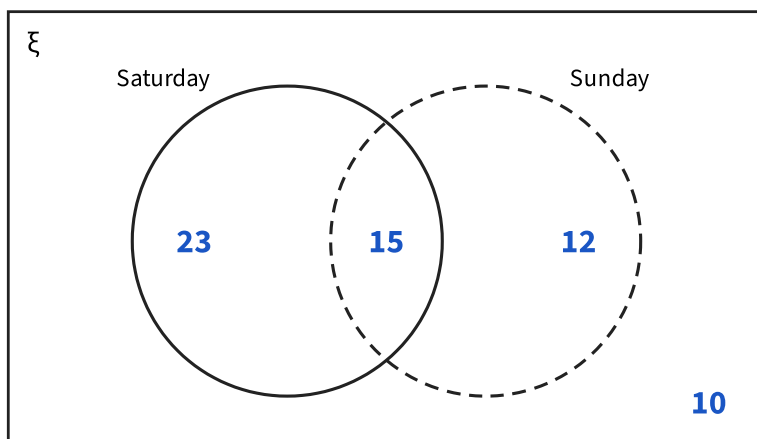
Answer $\frac{10}{60}$ or $\frac{1}{6}$ (1)

[1 mark]

- 7 A running club has 60 members.

38 members run on Saturdays, 27 run on Sundays and 15 run on both days.

(a) Complete the Venn diagram.



15 in the overlap (1)

23, 12 and 10 (1)

[2 marks]

(b) A member is chosen at random. Work out the probability that the member runs on exactly one of the two days.

$$23 + 12 = 35$$

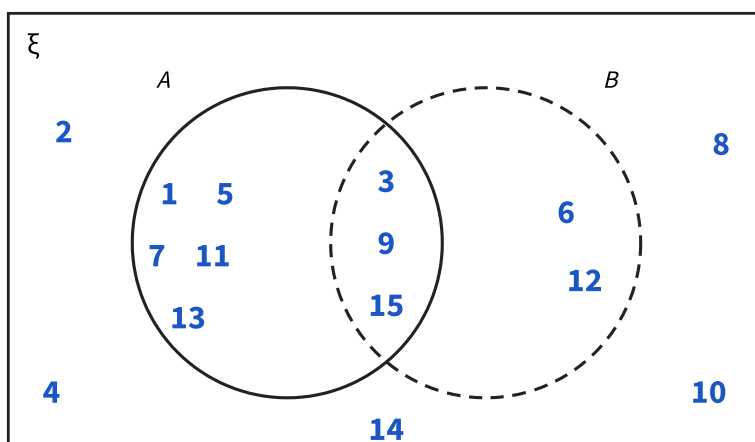
Answer $\frac{35}{60}$ or $\frac{7}{12}$ (1)

[1 mark]

8 $\xi = \{\text{whole numbers from 1 to 15}\}$

$A = \{\text{odd numbers}\}$ $B = \{\text{multiples of 3}\}$

(a) Complete the Venn diagram.



*3, 9, 15 in the overlap (1)
the rest correct (1)*

[2 marks]

(b) A number is chosen at random from ξ . Find $P(A \cup B)$.

Answer $\frac{10}{15}$ or $\frac{2}{3}$ (1)

[1 mark]

9 The probability that a hockey team wins a match is 0.45. The probability that it draws is 0.3

(a) Work out the probability that the team wins or draws its next match.

Answer 0.75 (1)

[1 mark]

(b) The results of matches are independent. Work out the probability that the team wins both of its next two matches.

0.45×0.45

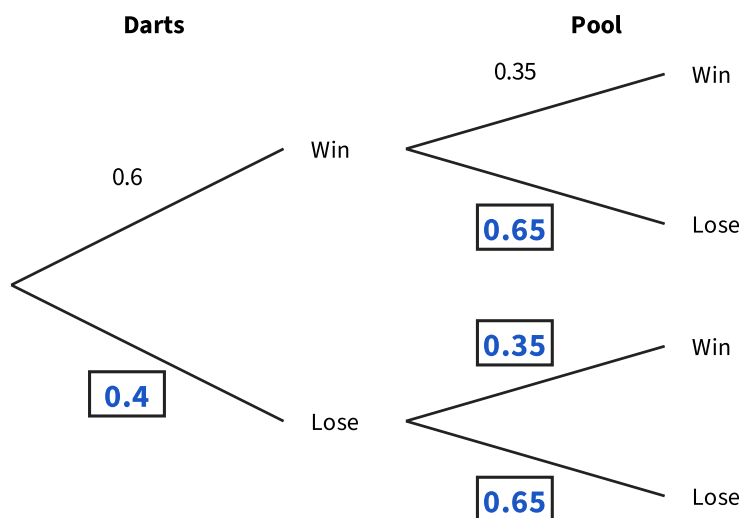
Answer 0.2025 (1)

[1 mark]

- 10** Leah plays a game of darts and then a game of pool.

The probability that she wins at darts is 0.6. The probability that she wins at pool is 0.35. The two games are independent.

- (a)** Complete the tree diagram.



0.4, 0.65 and 0.65 (1)

[1 mark]

- (b)** Work out the probability that Leah wins exactly one of the two games.

$$0.6 \times 0.65 = 0.39 \text{ or } 0.4 \times 0.35 = 0.14 \text{ (1)}$$

$$0.39 + 0.14$$

Answer 0.53 (1)

[2 marks]

- 11** A drawer contains 5 black socks and 3 grey socks.

Two socks are taken at random, without replacement.

Work out the probability that the two socks are the same colour.

$$\frac{5}{8} \times \frac{4}{7} = \frac{20}{56} \text{ (1)}$$

$$\frac{3}{8} \times \frac{2}{7} = \frac{6}{56} \text{ (1)}$$

Answer $\frac{26}{56}$ or $\frac{13}{28}$ (1)

[3 marks]

12

The table shows information about 120 plants sold at a garden centre.

	Flowering	Not flowering	Total
Indoor	14	34	48
Outdoor	41	31	72
Total	55	65	120

A flowering plant is chosen at random. Work out the probability that it is an indoor plant.

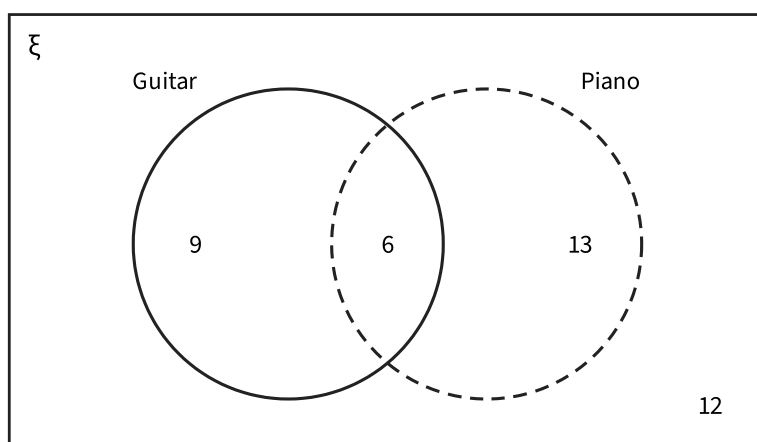
denominator 55 (1)

Answer $\frac{14}{55}$ (1)

[2 marks]

13

The Venn diagram shows how many of 40 students play the guitar and how many play the piano.



A student who plays the piano is chosen at random. Work out the probability that this student also plays the guitar.

6 + 13 = 19, the denominator (1)

Answer $\frac{6}{19}$ (1)

[2 marks]

Question	Topic	RAG
1	I can work out the probability of a single event	
2	I can use the fact that probabilities add to 1	
3	I can use relative frequency to estimate a probability and an expected outcome	
4	I can use a sample space diagram	
5	I can complete and use a frequency tree	
6	I can complete and use a two-way table	
7	I can complete and use a Venn diagram	
8	I can use set notation with a Venn diagram	
9	I can use the AND and OR rules	
10	I can use a tree diagram for independent events	
11	I can work out probabilities without replacement	
12	I can find a conditional probability from a two-way table	
13	I can find a conditional probability from a Venn diagram	