

Twenty-five balls have numbers printed on them.
Some of the balls are coloured yellow (Y), the others are coloured blue (B).
The list below shows both the colour of each ball and the number printed on it.

Y 76	Y 217	B 54	B 126	Y 21
Y 438	Y 32	B 561	B 194	Y 69
B 37	B 518	Y 94	Y 157	Y 208
Y 382	B 56	B 234	Y 72	B 84
Y 68	Y 271	Y 53	B 100	Y 321

- (a) Complete the frequency table. [2]

Type of ball	Yellow		Blue	
	Number < 100	Number \geq 100	Number < 100	Number \geq 100
Frequency	8			

- (b) How can you use your table to check that all the balls have been counted? [1]

- (c) The 25 balls are placed in a box.
One ball is chosen at random.
What is the probability that it is a yellow ball numbered less than 100? [2]

Intermediate Maths Sample 2 P2 Q3

- (a) Circle the correct answer for each of the following statements.

- (i) Helen has bought one of the eighty tickets sold in a raffle. The probability that Helen wins the top prize in the raffle is

$\frac{1}{79}$

 1%

 1:80

 $\frac{1}{80}$

 80%

[1]

- (ii) One ball is selected at random from a box containing 5 blue balls, 4 red balls and 1 yellow ball. The probability that the selected ball is blue is

$\frac{5}{5}$

 $\frac{1}{2}$

 $\frac{5}{41}$

 $\frac{10}{5}$

 5%

[1]

(b) A bag contains some red, green and black beads.

One bead is selected at random from the bag.

The probability of selecting a green bead from the bag is $\frac{1}{3}$.

Which of the following sets of beads could have been in the bag?

Circle the correct answer.

2 red 1 green 1 black	3 red 6 green 3 black	3 red 3 green 4 black	7 red 4 green 1 black	5 red 3 green 4 black
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[1]

Intermediate Maths Sample 2 P1 Q3

Sian states,

'When a fair coin is tossed and a fair dice is thrown,
the probability of getting a head and an even number is $\frac{1}{2}$.'

Is Sian correct?

You must show enough working to justify your answer.

[4]

Intermediate Maths Summer 2018 P2 Q3

A travel company offers the following holiday options.

Time	Accommodation	Transport
Summer or Winter	Cottage or Hotel	Train or Bus or Car

- (a) List all the possible different combinations of holiday options that the company offers.
One has been done for you.

[3]

<u>Time</u>	<u>Accommodation</u>	<u>Transport</u>
Summer	Cottage	Train

- (b) A holiday is chosen at random from all the different combinations on offer.
P is the probability that the chosen holiday is a

Summer holiday, staying in a Cottage and travelling by Train.

Mark the point P on the probability scale shown below.

[1]



Intermediate Maths June 2017 P1 Q4

- (a) A fair, six-sided dice is rolled.
What is the probability that a 4 is shown on the dice?
Circle your answer.

[1]

6% $\frac{1}{5}$ $\frac{1}{4}$ 6:1 $\frac{1}{6}$

- (b) 50 raffle tickets were sold at a charity event.
Sian has a 20% chance of winning the top prize.
How many tickets did Sian buy?
Circle your answer.

[1]

1 2 4 10 20

- (c) A bag contains a mixture of blue beads, yellow beads and pink beads.
One bead is taken at random from the bag.

The probability that the bead is pink is $\frac{1}{5}$.

Which of the following sets of beads could have been in the bag?
Circle your answer.

[1]



Intermediate Maths Summer 2018 P1 Q4

A bag contains a number of different coloured balls.
A ball is selected at random from the bag.
The probability of selecting a blue ball is 0.3.

- (a) Why is the following statement incorrect?
Explain your answer clearly.

[1]

'More than half the balls in the bag are blue.'

(b) What is the probability that a ball selected at random from the bag is not blue? [1]

(c) There are 50 balls in the bag.
How many of them are blue? [2]

Intermediate Maths Sample 1 P1 Q5

In a game, cards are chosen at random from two boxes.

One card is chosen at random from box A and one card is chosen at random from box B.

Box A contains these two cards.

-3	+3
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Box B contains these five cards.

-2	-1	0	+1	+2
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The two numbers on the chosen cards are multiplied together to give a score.

The person choosing the cards wins a prize if the score is more than zero.

Complete the table below to show all the possible scores and calculate an estimate for the number of prize winners when 70 people play the game once. [6]

		Box B				
		-2	-1	0	+1	+2
Box A	-3				-3	-6
	+3				+3	+6

Intermediate Maths Nov 2016 P1 Q5

Three **red** cards have the following numbers written on them.

3	6	9
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Four **green** cards have the following numbers written on them.

1	2	3	4
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In a game, the cards are turned face down.

A player chooses one red card and one green card at random.

The player's score is the sum of the two numbers.

(a) Complete the following table.

[1]

Red card	Score			
	9	11
	6	8
	3	4	5	6
		1	2	3
				4
		Green card		

(b) A player wins a prize if the score is **more** than 9.
Safira plays the game once. What is the probability that she wins a prize?

[2]

(c) 60 people play the game once.
Approximately how many people would you expect to win a prize?

[2]

Intermediate Maths Nov 2018 P1 Q6

In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.

A box contains five identical balls numbered 1 to 5 respectively.
One ball is chosen at random from the box.
Its number is recorded and the ball is replaced in the box.

This process was carried out 75 times in total.

How many times would you expect an **even-numbered** ball to have been chosen?

You must show all your working.

[3 + 2 OCW]

Intermediate Maths June 2017 P1 Q6

David, Jane and Mary are beach inspectors.

Three beaches, Harlech, Rhyl and Porthcawl, are all to be inspected on a certain day.

It is decided to share the work so that the inspectors will visit one beach each, chosen at random.

(a) List all the possible different ways they could share the work.
One has been done for you.

[2]

David → Harlech, Jane → Rhyl and Mary → Porthcawl

(b) What is the probability that one of the female inspectors will visit Rhyl?

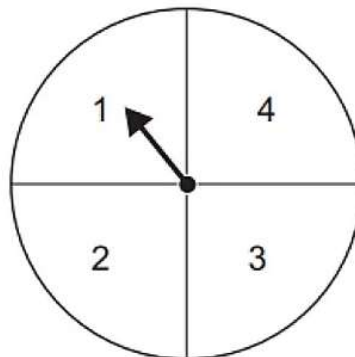
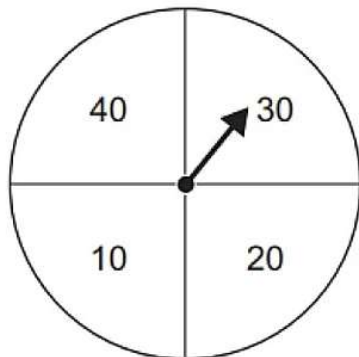
[2]

Intermediate Maths Nov 2018 P2 Q7

Two fair spinners are divided into quarters as shown below.

One spinner shows the values 10, 20, 30 and 40.

The other spinner shows the values 1, 2, 3 and 4.



The two spinners are spun and the values shown are added together to form a number.
For example, the diagram above would form the number 31.

Consider all the possible numbers that can be formed.

Calculate the probability that the spinners will form a number that is a multiple of 7.

You must show all your working in order to justify your answer.

[4]

Intermediate Maths Summer 2019 P2 Q8

Alison and Sarfraz play a game. They each have a different bag of cards.

Alison has the following cards in her bag.



Sarfraz has the following cards in his bag.



They each take a card at random from their own bag. They make a note of the letter, and return the card to the bag.

They each do this 100 times.

Who do you think is likely to choose the letter R more often?

Alison ☐ Sarfraz ☐

You must explain your decision and show all your working.

[4]

Mair either walks, cycles, travels by car or travels by bus to work each day.
Her method of travel each day is independent of her method of travel on any other day.

The table below shows the probability for three of her methods of travel on any randomly chosen day.

Method of travel	Walk	Bike	Car	Bus
Probability		0.45	0.1	0.25

- (a) Calculate the probability that, on any randomly chosen day, she walks to work. [2]
- (b) What is the probability that, on any randomly chosen day, she either travelled to work by car or by bus? [2]
- (c) What is the probability that, in any randomly chosen week, Mair travelled to work by car on the Monday and by bus on the Tuesday? [2]

Intermediate Maths June 2017 P1 Q10

Ceri has a set of cards.
Each of her cards is labelled North, East, South or West.

The table below shows the probability distribution when a card is taken from the set of cards at random.

Label	North	East	South	West
Probability	0.4	0.25	0.2	0.15

- (a) Ceri chooses one card at random from her set of cards.
What is the probability that the card is labelled East or South? [2]
- (b) Sasha has an identical set of cards.
Ceri and Sasha each choose one card at random from their set of cards.
What is the probability that they both choose a card labelled North? [2]
-

Intermediate Maths Summer 2018 P2 Q10

A box contains many discs, identical in shape and size.
A picture of one of four Welsh castles is printed on each disc.

- (a) A disc is chosen at random from the box.
Complete the table below to find the probability of choosing a disc showing Dinefwr Castle. [2]

Picture	Caernarfon Castle	Harlech Castle	Rhuddlan Castle	Dinefwr Castle
Probability	0.36	0.12	0.24	

- (b) In the box, there were 522 discs showing a picture of Caernarfon Castle.
How many of the discs showed a picture of Harlech Castle? [2]

Intermediate Maths Nov 2016 P1 Q12

A fair six-sided dice and a fair coin are thrown together once.

Circle the correct answer for each of the following statements.

- (a) The number of possible outcomes is [1]

2 6 8 12 24.

- (b) The probability of getting a 4 on the dice and a tail on the coin is [1]

$\frac{1}{8}$ $\frac{1}{12}$ $\frac{1}{2}$ $\frac{1}{6}$ $\frac{1}{24}$.

- (c) The probability of getting a multiple of 3 on the dice and a head on the coin is [1]

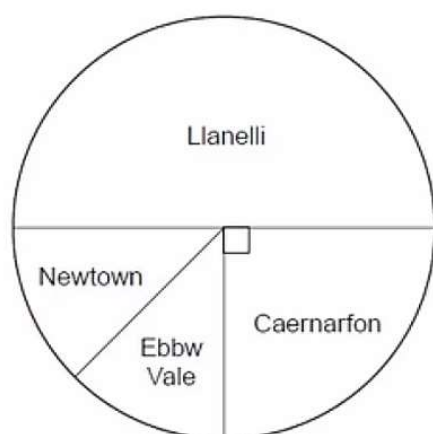
$\frac{1}{8}$ $\frac{1}{12}$ $\frac{1}{2}$ $\frac{1}{6}$ $\frac{1}{24}$.

Intermediate Maths Summer 2018 P1_Q13

- (a) A fair, six-sided dice is thrown twice.
What is the probability that a 3 is thrown on both occasions? [2]

- (b) A company has offices in Llanelli, Caernarfon, Newtown and Ebbw Vale.
Its national committee is made up of workers from these four offices.

The pie chart below shows what fraction of the committee members come from each office.



There is an equal number of members from Newtown and Ebbw Vale.

A member is chosen at random from this committee to be its chairperson.

- (i) The probability that the chosen member works at the Llanelli office is shown in the table below.

Complete the table.

[2]

Office	Llanelli	Caernarfon	Newtown	Ebbw Vale
Probability	$\frac{1}{2}$			

- (ii) What is the probability that the member chosen as chairperson works at either the Llanelli or the Ebbw Vale office?
You must show all your working.

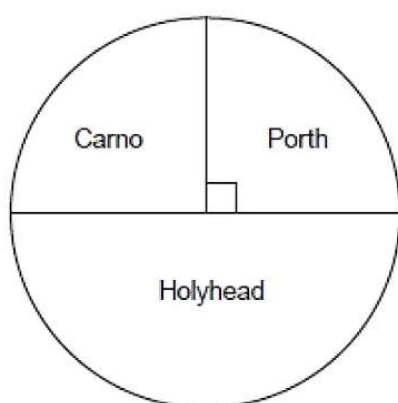
[2]

Intermediate Maths Summer 2019 P2 Q13

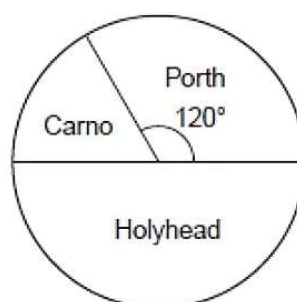
A company has 3 sites based in Wales.

One is in Carno, one is in Holyhead and one is in Porth.

The pie charts below show the distribution of its 128 female staff and 72 male staff.



128 female staff



72 male staff

A person is chosen at random from the company's 200 staff members.
What is the probability that this person works at the Porth site?

[4]