

# Maths Take-Away Menu

## Probability

### Mutually Exclusive

A pair of dices are rolled.  
Give an example of two events that are mutually exclusive and two events that are not.

### Spot the Mistake

A bag contains blue, red, yellow and orange balls. The table shows the probability of randomly choosing each colour from the bag.

Colour	Blue	Red	Yellow	Orange
Probability	0.27	0.32	0.37	0.4

Why is the table incorrect?  
What is the likely mistake to have been made?

### Relative Frequency

Vera throws a coin and notes the number of heads obtained.

84 heads out of 100 throws.

143 heads out of 200 throws.

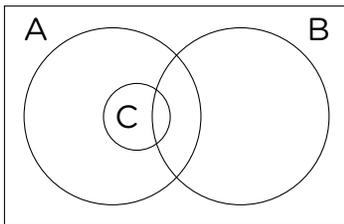
196 heads out of 300 throws.

Estimate the probability of throwing a head with Vera's coin. Explain your answer.

### Understanding Diagrams

A group of students belong to one or more of three groups

- A - Those who like music
- B - Those who like sports
- C - Those who like art



Choose the correct statement from the following:  
All who like music like art.  
If a student likes art they don't like sports.  
All who like art like music.

### The Chance of Losing?

Jack says 'If the probability of Heatherfield Football club winning their next game is 0.68 then the probability of them losing is 0.32.'  
Explain why Jack is incorrect.

£2 **Drinks**  
These mixed questions will make a great accompaniment to your meal.



£2 **Orange Sweets** £1  
The probability of Sam choosing a particular flavour sweet from the sweet box is given in the table.

Flavour	Grape	Lemon	Lime	Orange	Strawberry
Probability	$\frac{1}{8}$	$\frac{1}{3}$	$\frac{1}{6}$	.....	$\frac{1}{4}$

£1 Find the probability of Sam choosing his favourite, an orange flavoured sweet.

### Raffle Tickets

In a bag there are 60 green raffle tickets and some yellow tickets. The probability of choosing a yellow ticket is 0.76. How many of the raffle tickets are yellow?

£1 **Two dice** £2  
Two dice are rolled. Find the probability that the product of the two numbers is a square number.

### Test Results

In a class of 30 students, 19 passed their Mathematics exam and 14 passed their Science exam. 6 students did not pass either examination. Draw a Venn diagram to show this information.

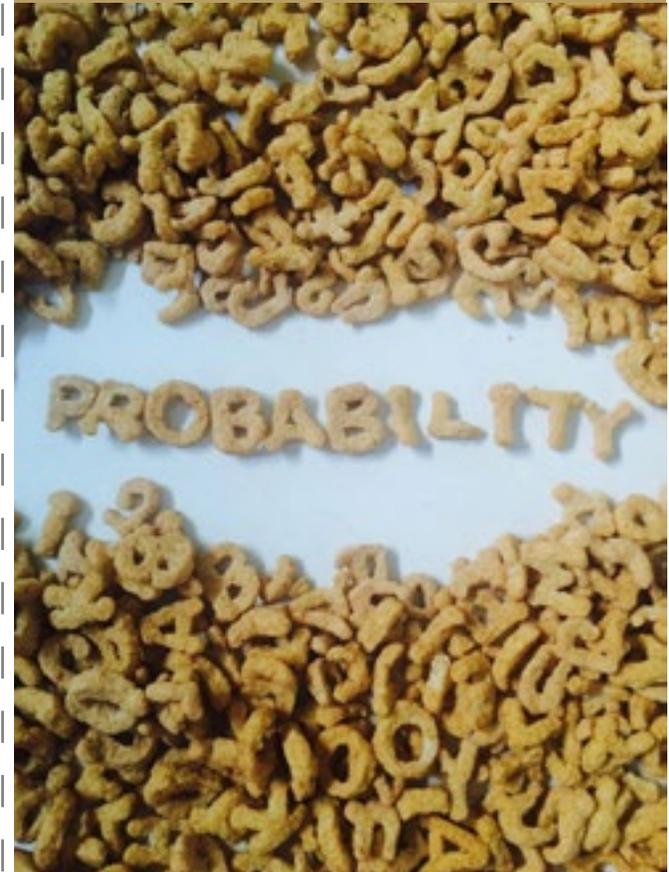
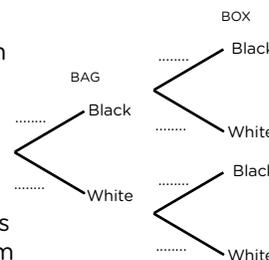
### The Coconut Shy

The probability of winning a prize at the coconut shy is  $\frac{2}{15}$ . If 180 people play the game, how many people would you expect to lose?

### Tree Diagrams

A bag and box contain black and white tiles. Their contents are identical.

£2 A tile is chosen at random from the bag and then another tile is chosen at random from the box. The probability of choosing two white tiles is 0.09. Use this information to complete the tree diagram.



## Using this Take-Away Menu

For each sitting you will need to choose a Starter, Main Course, Dessert & Drink.

The prices vary for each course.



This symbol indicates that a calculator may be used when answering the question.

Remember to ensure that you show your workings clearly.

If you have any questions don't forget to ask your waiter (that's your teacher).

Enjoy your meal!

## Starters

These are quick questions designed to warm you up and get your appetite for maths going!



### Probability 1

A bag contains Scrabble tiles. There is one tile for each letter of the alphabet. Find the probability that a letter chosen at random will appear in the word SCRABBLE.

### Probability as a Fraction

A bag contains 5 red balls, 3 green balls, 4 white balls and 2 black balls. A ball is chosen at random.

Find the probability of choosing a black or white ball. Write your answer as a fraction in its simplest form.

### Pack of Cards

Two cards are drawn from a pack of 52 playing cards, the ace of spades and the Queen of clubs.

What is the probability that the next card drawn will be a red card?

### Possible Scores

List all the possible scores when rolling two dices and the score is the difference between the largest and smallest number rolled.

## Relative Frequency

A farmer plants 50 pumpkin seeds of which 42 grow into pumpkins. Find the relative frequency that a pumpkin seed will produce a pumpkin.

## $A \cap B$

If  $A = \{1, 4, 9, 16, 25, 36, 49, 64, 81, 100\}$  and  $B = \{1, 8, 27, 64, 125\}$

Write down the elements of  $A \cap B$ .

## Main Course

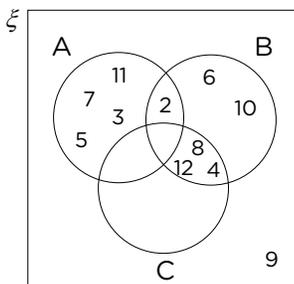
Your main dish is probability based and is served with 'portions' from other areas of Maths or real life applications. These problem solving questions may take a bit more time to digest.



## Subsets

A, B and C are subsets of a universal set. Use the Venn diagram to find:

- $\xi = \{ \quad \}$
- A =
- B =
- C =



## The Science Exam

There are two parts to a Science examination. A practical test and then a written test.

The probability that Isaac passes the practical test is 0.6. The probability that he passes both tests is 0.48.

If he fails the practical test the probability of him passing the written test is 1/4 of the probability of him passing the practical test. Show this information in a tree diagram and calculate the probability that Isaac will fail one of his tests.

## Noah's Ark

On Noah's Ark there were  $n$  pairs of animals and a number of their offspring. There were 6 more young females than adult females and 4 more young males than young females. There were 96 animals on the ark altogether. Write an equation that satisfies  $n$  and find the probability that the first animal to exit the ark was an adult female. Write your answer as a fraction in its simplest form.

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## Basketball Game



Dane charges his customers £1.50 to play his basketball game. They get one shot at the hoop, if the ball goes in they win £3.50. The probability that the ball goes in is 2/9.

Estimate how many customers Dane needs to make a profit of £200 or more.

£1

## Christmas Bonus



A company director randomly selects 3 of his employees to receive a £1000 Christmas bonus. The table shows the number of employees and their position.

Salesperson	Team Leader	Manager
16	4	2

Find the probability that the three people selected are of the same position.

## Jelly and Ice Cream

45 children attended Zainab's birthday party. For dessert some of the children had just jelly, 24 had jelly and ice cream, 12 had just ice cream and 4 went without. Show this information on a Venn diagram and use it to find the probability of randomly selecting a child who ate jelly at the party.

£3

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## Dessert

"The proof of the pudding is in the eating".

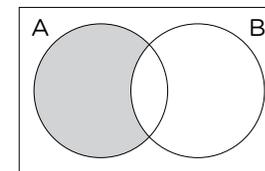
These questions are designed to test your understanding of key probability concepts.



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## Venn Diagram

" $A \cap B$ ' is represented by the shaded region". Do you agree with this statement? Explain your answer.



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