SCORE

Data & Measurement

With Classified answer book

8

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1- Probability

1 Jamal buys a sandwich from a sandwich bar. The sandwich bar sells only sandwiches but sells a number of different types of sandwich. The probability that Jamal will buy a cheese sandwich is 0.2. Decide whether each of the following statements:

'is always true' 'could be true' 'is never true'

a) The probability that Jamal will buy a cheese sandwich is $\frac{1}{5}$

b) There are only 5 different types of sandwich in the sandwich bar

c) There is a more than evens chance that Jamal will get a cheese sandwich.

d) Jamal loves cheese.

e)It is possible that he will get a jam sandwich.

f) There is an 80% probability that he will buy a sandwich which is not cheese.

2 At a school event, each student has a choice of drink during the break. They may have juice or water, with or without ice. Each student chooses one drink and the table, below, shows their choices.

	Juice	Water
With ice	42	12
Without ice	34	32

The maths teacher decides to pick a student at random during the break to ask which they chose.

a) What is the probability that the student chose juice with ice?

b) She has 10% of picking a student who chose _____.

c) She has a $\frac{4}{15}$ chance of picking a student who chose _____.

d) Hanna says that P(juice with ice) = 1 – P(juice without ice) is she correct? Explain your answer

3 Gabriella throws a biased dice.

The table shows the probability of getting some of the scores.

Score	1	2	3	4	5	6
Probability	0.25	0.3		0.1	0.15	

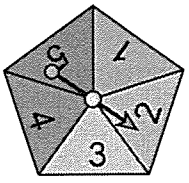
The probability of a score of 3 is equal to the probability of a score of 6.

a) Calculate the probability that Gabriella scores a number less than 3.

b) Gabriella says that the probability that she scores an odd number is 0.5. Show that Gabriella is correct.

4 Henri throws a normal dice.

He also spins this fair 5 sided spinner.



He adds together the number on the dice and the number on the spinner to get a total score.

a) Draw a sample space diagram to show all the possible total scores.

b) Work out the probability that his total score is a multiple of 3.

5 Sasha plays 50 games of tennis.
He wins 16 of the games.

Four of Sasha's friends try to work out the relative frequency of Sasha winning a game of tennis.

Sean The relative frequency is 0.16	**Talia** The relative frequency is 3.125	**Moira** The relative frequency is 0.32	**Steve** The relative frequency is 16

Who has given the correct value for the relative frequency?

6. Two schools enter pupils for an examination.

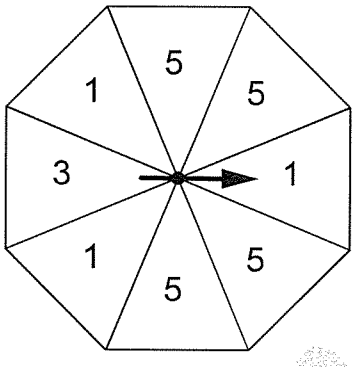
In School A, 450 students take the examination and 398 pass.

In School B, 280 students take the examination and 231 pass.

In which school were students more likely to pass the examination?

Show how you work out your answer.

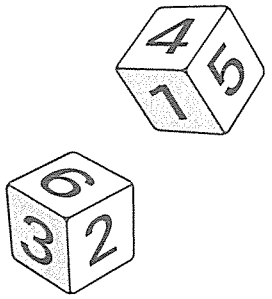
7. Tom has a fair spinner with 8 equal sections. He is going to spin the pointer.



Draw lines to show how likely the following are. One is done for you.

He will spin the **number 3**	certain
He will spin the **number 5**	likely
He will spin the **number 6**	even chance
He will spin a **number less than 7**	unlikely
	impossible

8. I have two dice, each numbered 1 to 6



I am going to throw both dice and add the numbers.

Which of these **totals** are **impossible** to get?

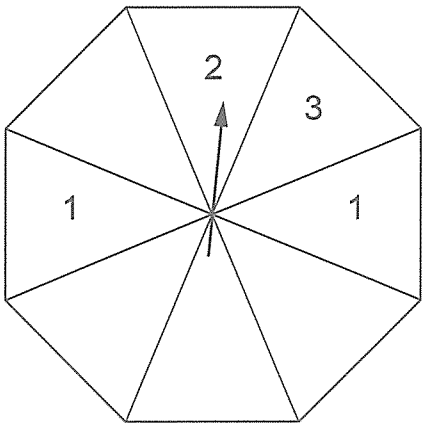
Put a ring round the impossible ones.

12 5 20 8 1

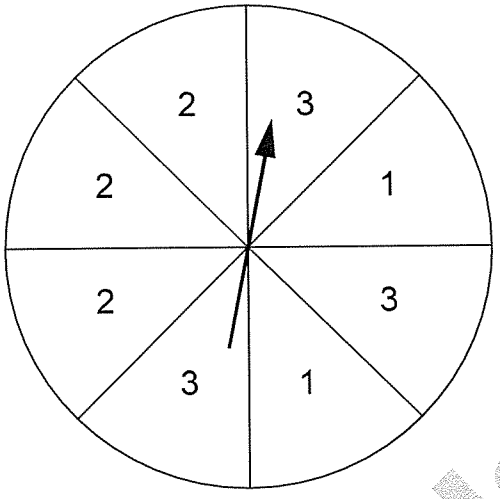
9. The diagram shows a fair spinner divided into 8 equal sections.

I am going to spin the pointer.

Write numbers on the blank sections so that there is a **50% chance** that I will spin an **odd number**.



10. Here is a fair spinner divided into 8 equal sections.



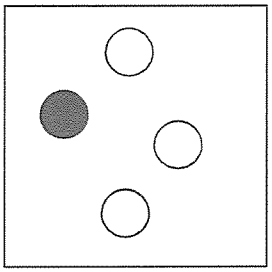
I am going to spin the pointer.

For each statement below, tick (✓) True or False.

	True	False
I am **equally likely** to spin a 2 as to spin a 3	☐	☐
I am **more likely** to spin an even number than an odd number.	☐	☐
It is **impossible** that I will spin a number less than 2	☐	☐
It is **certain** that I will spin a number less than 4	☐	☐

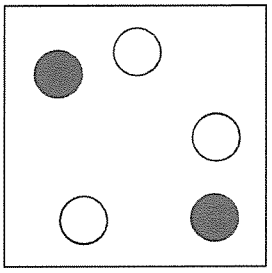
11.

Box A



One black and three white counters

Box B



Two black and three white counters

(a) I am going to take a counter from one of the boxes without looking.

Which box gives the **higher chance** of taking a **white** counter?

☐ Box A ☐ Box B

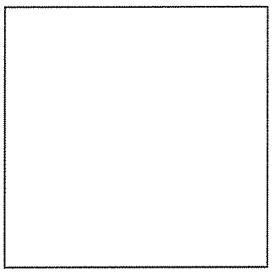
Explain your answer.

(b) I am going to take a counter from box C without looking.

It is **just as likely** that I will get a white counter as a black counter.

Show what counters might be in box C.

Box C



12. Meg and Ravi buy sweet pea seeds and grow them in identical conditions.

Meg's results:

Number of packets	Number of seeds in each packet	Number of seeds that germinate from each packet
5	20	18, 17, 17, 18, 19

Ravi's results:

Number of packets	Number of seeds in each packet	**Total** number of seeds that germinate
10	20	170

(a) Using Meg's results and Ravi's results, calculate two different estimates of the **probability** that a sweet pea seed will germinate.

Using Meg's results: .....

Using Ravi's results: .....

(b) Whose results are likely to give the better estimate of the probability?

☐ Meg's ☐ Ravi's

Explain why.

13. I buy **12 packets** of cat food in a box.

The table shows the different varieties in the box.

Variety	Number of packets
Cod	3
Salmon	3
Trout	3
Tuna	3

(a) I am going to take out a packet at random from the box.
What is the **probability** that it will be **cod**?

(b) My cat eats **all** the packets of **cod**.
I am going to take out a packet at random from the ones left in the box. What is the **probability** that it will be **salmon**?

(c) A different type of cat food has **10 packets** in a box.
The probability that the variety is chicken is **0.7** What is the probability that the variety is **not** chicken?

14 A computer is going to choose a letter at random from an English book.

The table shows the probabilities of the computer choosing each vowel.

Vowel	A	E	I	O	U
Probability	0.08	0.13	0.07	0.08	0.03

(a) What is the probability that it will **not** choose a vowel?

(b) The probability that the computer will choose the letter **T** is **0.09**

The computer chooses a letter at random, and then another, and then another. What is the probability that these letters will be **E, then A, then T**?

15. Alisha has some coloured counters in a bag.

She is going to take a counter at random from the bag.

The table shows the probability of taking a red, blue, green or yellow counter.

Colour	Probability
Red	$\frac{1}{2}$
Blue	$\frac{1}{4}$
Green	$\frac{1}{8}$
Yellow	$\frac{1}{8}$

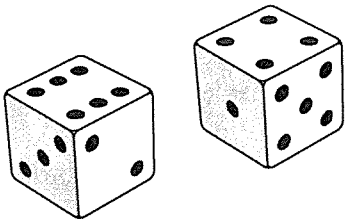
(a) Explain how you know that **all** the counters in the bag are either red, blue, green or yellow.

(b) Alisha says:

'The total number of counters in the bag is **30**'

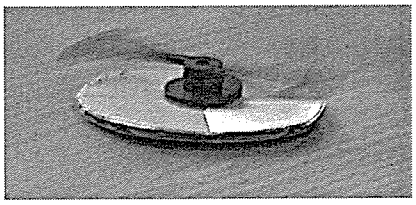
Explain why Alisha **cannot** be correct.

16. I have two fair dice, each numbered 1 to 6 I am going to throw the two dice.



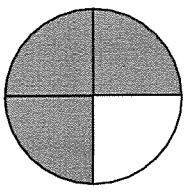
What is the probability that the **sum** of the numbers on the dice will be a **square number**?

17. Ada makes a spinner.



The probability that it lands on grey is $\frac{3}{4}$

The probability that it lands on white is $\frac{1}{4}$



Ada spins the spinner 100 times.

How many times would you expect the pointer to land on grey?

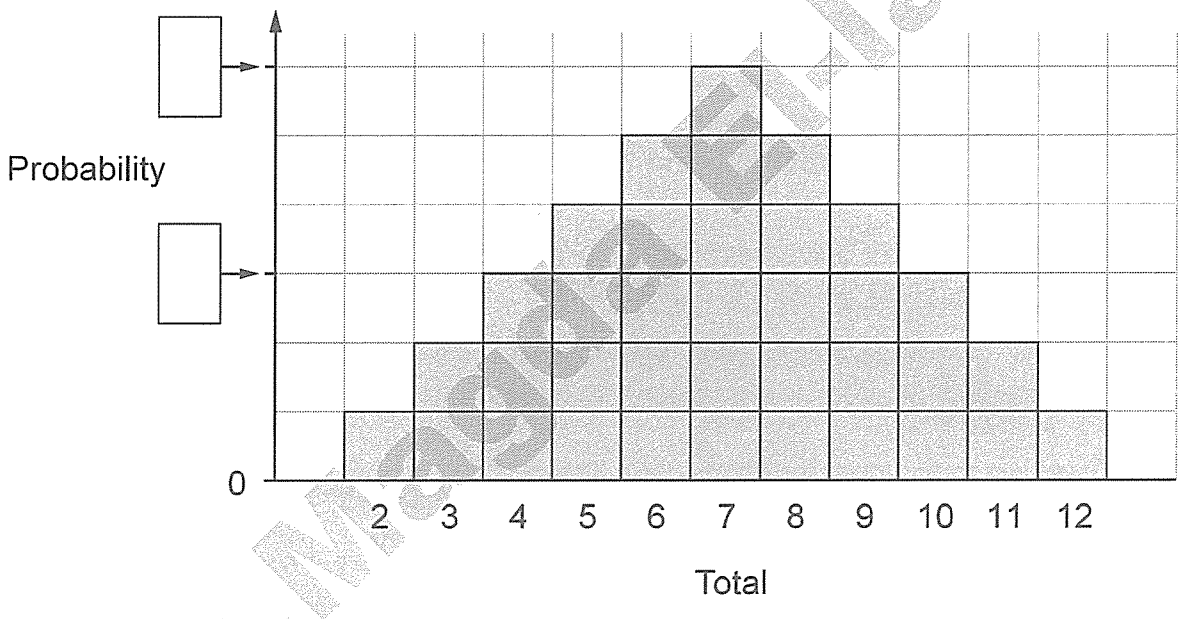
18. Sam has two fair, **six-sided** dice. Both dice are numbered 1 to 6

He is going to throw the dice and **add** the scores.

(a) What is the probability that Sam will throw a total of 12?

(b) The chart shows the probability of different totals.

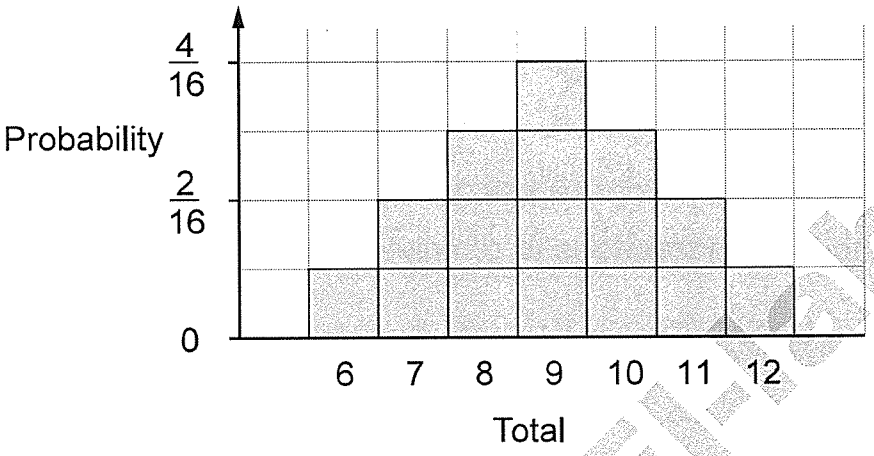
Write in the missing **fractions** to complete the diagram.



(c) Lisa also has two fair dice but hers are **four-sided**.

She is going to throw her dice and **add** the scores.

The chart shows the probability of different totals.



The same numbers are on both dice. What are the numbers?

_____, _____, _____, _____

19 16 people were asked to name their favourite fruit juice.

Here are the results.

Favourite juice	Frequency
Apple	6
Grapefruit	1
Orange	4
Mango	5

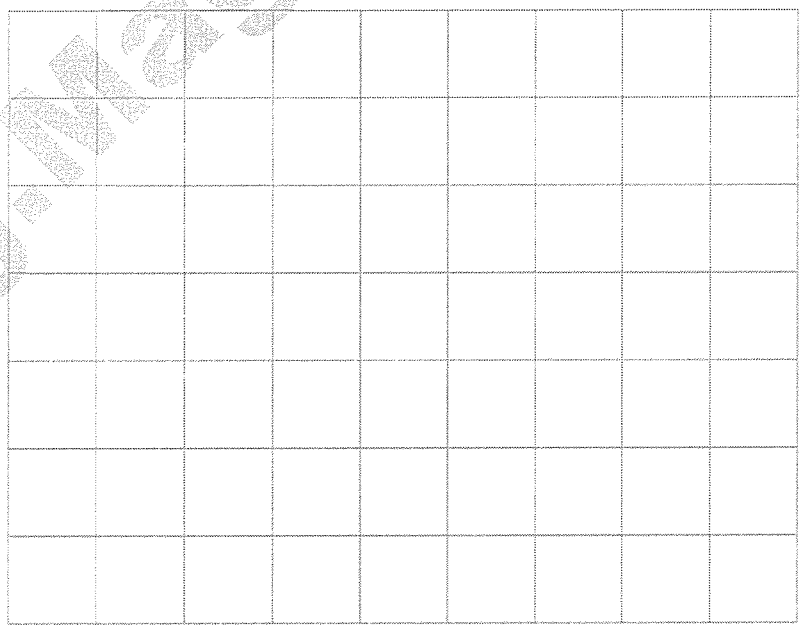
(a) One of the people was picked at random.

Work out the probability that their favourite juice was orange **or** mango.

Answer _____

(b) On the grid, draw a bar chart to represent the results.

Favourite juice



20 Babies born at a hospital are described as having Low or Medium or High mass at birth. The table shows some information about 200 babies born at the hospital last month.

(a) Fill in the missing values in the table.

	Male	Female	**Total**
Low mass	18	22	
Medium mass	46		**106**
High mass			
Total	**90**		**200**

(b) One of the **male** babies is chosen at random.

Find the probability he has a Medium mass.