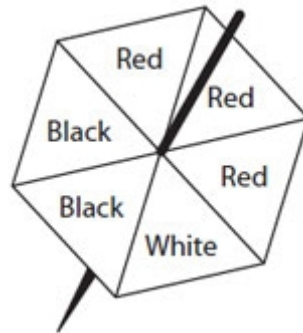


Foundation tier unit 13-1 check in test

Calculator

Q1. Here is a fair 6-sided spinner.

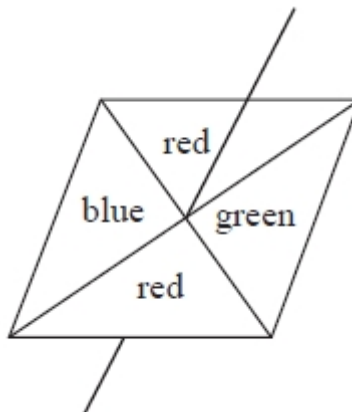


Jack will spin the spinner once.
The spinner will land on one of the colours.

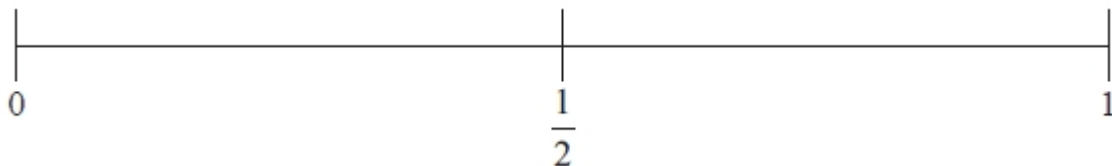
Choose the word that best describes the probability that the spinner will land on White.

| | | | | |
|------------|----------|------|--------|---------|
| impossible | unlikely | even | likely | certain |
|------------|----------|------|--------|---------|

Q2. Here is a fair 4-sided spinner.
The spinner can land on blue or on red or on green.



Lance spins the spinner once.
On the probability scale, mark with a cross the probability that the spinner will land on red.



Q3. There are some boys and girls in a classroom.
The probability of picking at random a boy is 35%

What is the probability of picking a girl?

- Q4. A bag contains 5 yellow counters, 3 red counters and 4 green counters.
What is the probability that a counter chosen at random is red or yellow?

[Q5–6 linked]

- Q5. Tim plays a game.

He can win the game or he can lose the game or he can draw the game.

The probability that Tim will win the game is 0.25

The probability that Tim will lose the game is x .

Give an expression, in terms of x , for the probability that he will draw the game.

- Q6. Tim plays a game.

He can win the game or he can lose the game or he can draw the game.

The probability that Tim will win the game is 0.25

Tim plays the game 240 times.

Work out an estimate for the number of times he will win the game.

- Q7. There are 72 guests staying in a hotel.
They are French or German or Spanish.

The two-way table shows some information about the guests.

| | French | German | Spanish | Total |
|--------|--------|--------|---------|-------|
| Female | 17 | | 14 | 40 |
| Male | | 13 | | 32 |
| Total | 29 | | 21 | 72 |

Complete the two-way table.

Use the table to find the probability that a guest chosen at random is German.

Q8. 100 students had some homework.

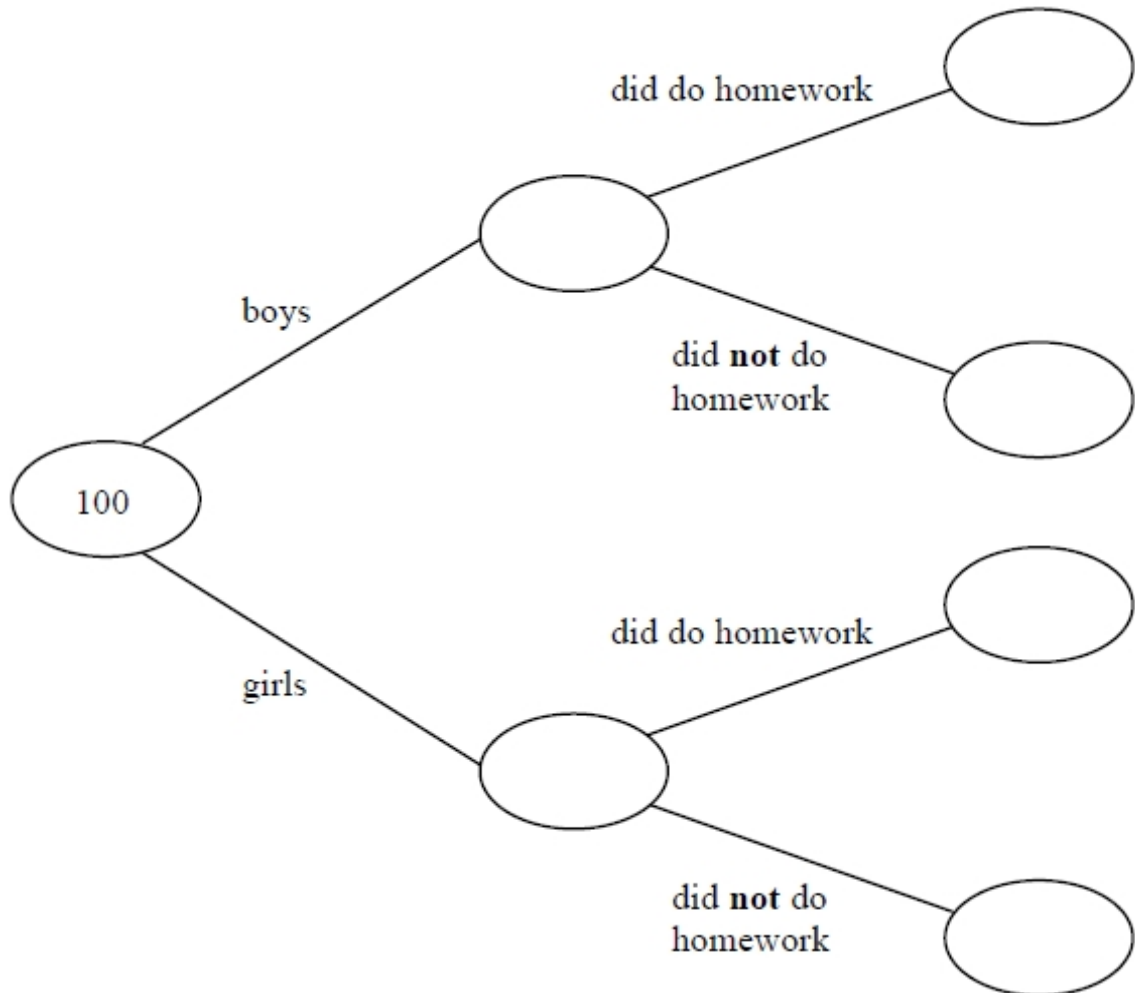
42 of these students are boys.

8 of the 100 students did **not** do their homework.

53 of the girls did do their homework.

One of the girls is chosen at random.

Complete the frequency tree and use it to work out the probability that this girl did **not** do her homework.



[Q9–10 linked]

Q9. David and Sarah do an experiment.

They throw a dice repeatedly and count how many times they score an odd number and how many times they score an even number.

The table shows their results.

| | Even | Odd |
|-------|------|-----|
| David | 84 | 102 |
| Sarah | 58 | 42 |

Work out the experimental probability of throwing an even number for both David and Sarah. Give your answers correct to two decimal places.

Q10. For the experiment in question 9, whose results are more likely to be reliable? Give a reason for your answer.

Topics listed in objectives

- Distinguish between events which are impossible, unlikely, even chance, likely, and certain to occur;
- Mark events and/or probabilities on a probability scale of 0 to 1;
- Write probabilities in words or fractions, decimals and percentages;
- Find the probability of an event happening using theoretical probability;
- Use theoretical models to include outcomes using dice, spinners, coins;
- List all outcomes for single events systematically;
- Work out probabilities from frequency tables, frequency trees, and two way tables;
- Record outcomes of probability experiments in tables;
- Add simple probabilities;
- Identify different mutually exclusive outcomes and know that the sum of the probabilities of all outcomes is 1;
- Using $1 - p$ as the probability of an event not occurring where p is the probability of the event occurring;
- Find a missing probability from a list or table including algebraic terms;
- Find the probability of an event happening using relative frequency;
- Estimate the number of times an event will occur, given the probability and the number of trials – for both experimental and theoretical probabilities;
- Compare experimental data and theoretical probabilities;
- Compare relative frequencies from samples of different sizes;

Answers

Q1. unlikely

Q2. cross marked at $\frac{1}{4}$

Q3. 65%

Q4. $\frac{2}{3}$

Q5. $0.75 - x$

Q6. 60

Q7. $\frac{11}{36}$

Q8. $\frac{5}{58}$

Q9. David 0.45, Sarah 0.58

Q10. David's results, because he has thrown the dice more times than Sarah.

Foundation tier unit 13-2 check in test

Calculator

- Q1. Jessica goes to an activity centre.
She can choose to do one of the three morning activities and one of the three afternoon activities.

The table shows one of the possible combinations Jessica can choose.

| Morning activities | Afternoon activities |
|---------------------------------------|------------------------------------|
| Cookery (C) Painting (P) Football (F) | Hockey (H) Acting (A) Swimming (S) |

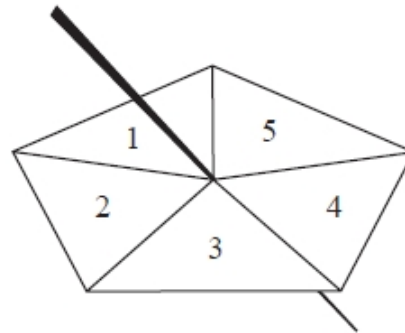
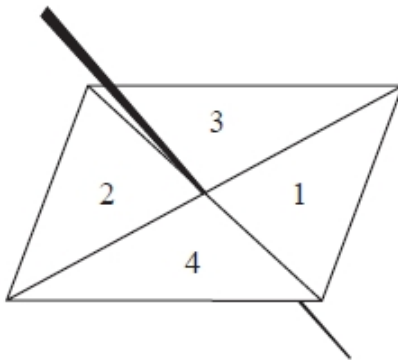
How many possible combinations are there?

- Q2. Udit has a bag of chocolate sweets.
There are 30 sweets in the bag.
This table shows the types of sweets in the bag.

| | Strawberry | Caramel | Nut |
|------------------------|-------------------|----------------|------------|
| Dark chocolate | 3 | 1 | 6 |
| Milk chocolate | 4 | 5 | 2 |
| White chocolate | 1 | 4 | 4 |

Udit takes at random a sweet from the bag.
Write down the probability that the sweet is a dark chocolate caramel.

Q3. Here are a 4-sided spinner and a 5-sided spinner.
The spinners are fair.



Jeff is going to spin each spinner once.
Each spinner will land on a number.
Jeff will get his score by adding these two numbers together.

Complete the possibility space diagram for each possible score.
Use the possibility space diagram to find the probability that Jeff gets a score of 5 or more.

| | | 5-sided spinner | | | | |
|-----------------|---|-----------------|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| 4-sided spinner | 1 | 2 | 3 | 4 | 5 | 6 |
| | 2 | 3 | | | | |
| | 3 | 4 | | | | |
| | 4 | 5 | | | | |

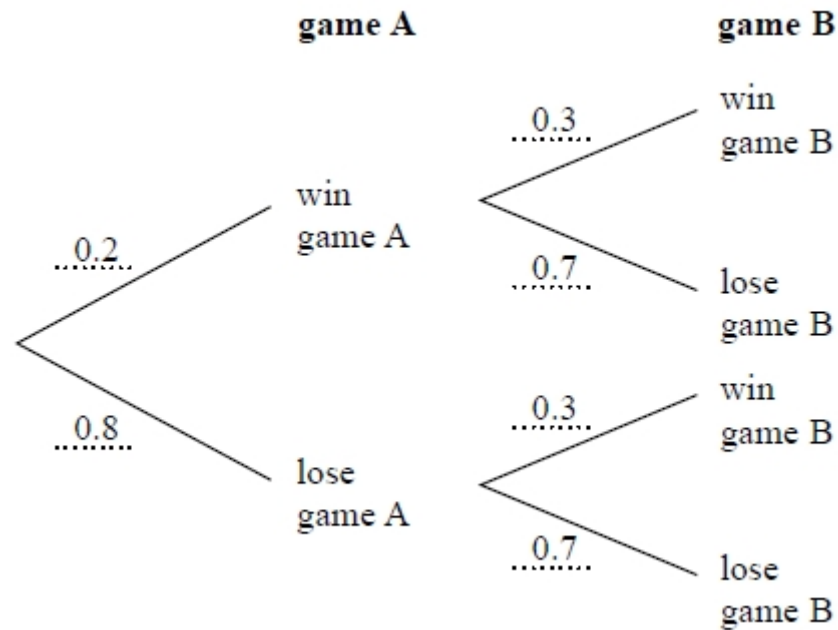
Q4. There are 25 boys and 32 girls in a club.

$\frac{2}{5}$ of the boys and $\frac{1}{2}$ of the girls walk to the club.

The club leader picks at random a child from the children who walk to the club.

Work out the probability that this child is a boy.

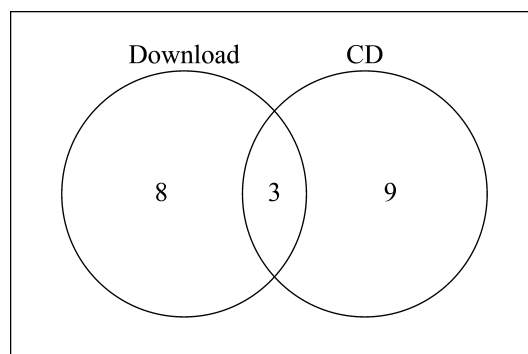
Q5. Here is a probability tree diagram.



Work out the probability of winning both games.

Q6. Thelma spins a biased coin twice.
The probability that it will come down heads both times is 0.09
Calculate the probability that it will come down tails both times.

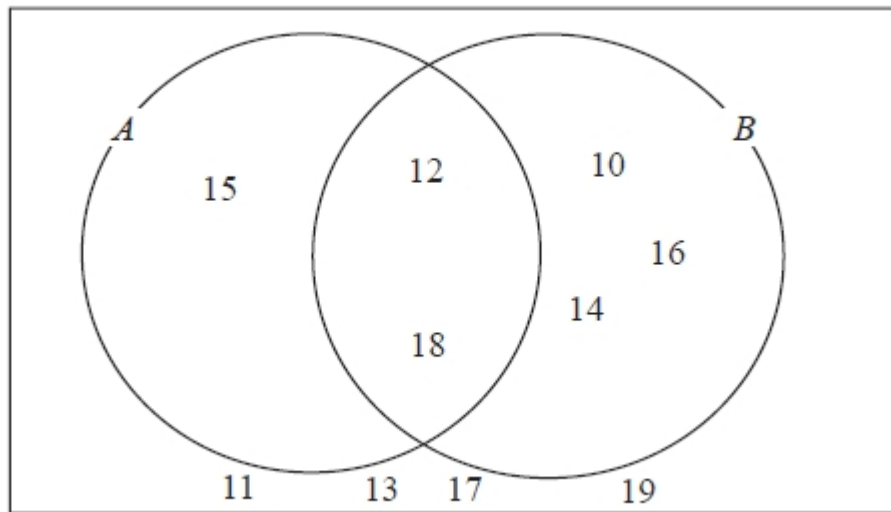
Q7. 20 students were asked whether they download music or listen to CDs.
The Venn diagram to shows the results.



A student is chosen at random.
Work out the probability that they download music.

[Q8–9 linked]

Q8. Here is a Venn diagram.



Write down the numbers that are in set $A \cup B$

Q9. One of the numbers in the Venn diagram in question 9 is chosen at random.

Find the probability that the number is in set A'

Q10. Stephen throws a fair dice until he gets a six.

Work out the probability that Stephen throws the dice

- (i) exactly once
- (ii) exactly twice

Topics listed in objectives

- List all outcomes for combined events systematically;
- Use and draw sample space diagrams;
- Work out probabilities from Venn diagrams to represent real-life situations and also ‘abstract’ sets of numbers/values;
- Use union and intersection notation;
- Find the probability of successive events, such as several throws of a single dice;
- Use tree diagrams to calculate the probability of two independent events;
- Use tree diagrams to calculate the probability of two dependent events.

Answers

Q1. 9

Q2. $\frac{1}{30}$

Q3. $\frac{7}{10}$

Q4. $\frac{5}{13}$

Q5. 0.06

Q6. 0.49

Q7. $\frac{11}{20}$

Q8. 10, 12, 14, 15, 16, 18

Q9. $\frac{7}{10}$

Q10. (i) $\frac{1}{6}$, (ii) $\frac{5}{36}$