Probability

- Describing situations involving chance
- Identifying the possible outcomes for a situation
- Recognising when the outcomes are equally likely
- Calculating the probability of an event for equally likely outcomes

Keywords

You should know

explanation 1a explanation 1b

1 For each statement write down the probability word that best matches it.

Impossible, **Unlikely**, **Even Chance**, **Likely**, **Certain**

a There will be at least one goal in the next F.A. Cup Final

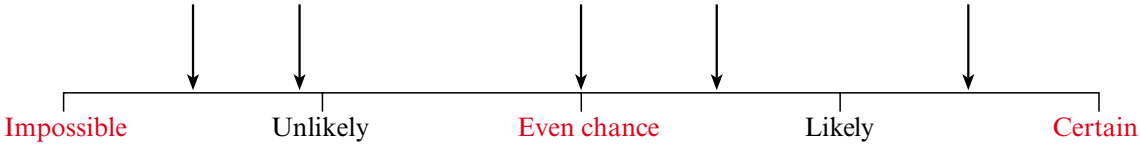
b The day after Monday will be Tuesday.

c A dice will show an odd number.

d The next person to walk past the classroom will be left handed.

e You will have a summer holiday on Mars this year.

2 Copy the probability scale and match the statement below to the arrows.



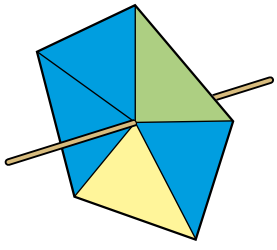
A The spinner shown lands on blue.

B A coin lands heads up.

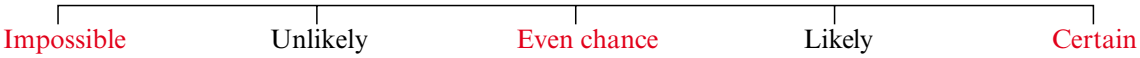
C The spinner shown lands on green.

D A dice is rolled to give a score of 3.

E A dice is rolled to give a score of less than 6.



3 Copy the probability scale and mark the probability of each statement on your scale.



a You correctly guess the answer to a multiple choice question with 3 options.

b A dart thrown at random at a dartboard will land in the bull's eye.

c A stone thrown up into clear air will fall back down.

d A world record will be broken at the next Olympics.

e You score 7 when you roll an ordinary dice.

f A person selected at random will have their birthday on December 25th.

***4** A class is discussing the probability of a pen breaking if it is dropped onto the floor.

Mitchell says it is an even chance because either the pen breaks or it doesn't break.

Explain why Mitchell is *not* correct.

5 Decide which of these outcomes has an even chance of happening. Give a reason for each answer.

a You will win the lottery if you buy a ticket.

b Rolling an even number on an ordinary dice.

c Getting a Tails when you spin an ordinary coin.

d Your head teacher will take your next Maths lesson.

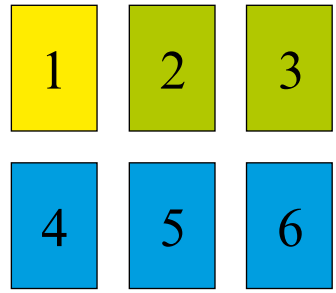
6 A bag contains eight red sweets and six yellow sweets. Four sweets are taken out of the bag.

What colours should those four sweets be to make these statements true when you pick one of the ten remaining sweets at random?

a There is an even chance of getting a red sweet.

b You are more likely to get a yellow sweet than a red sweet.

7 A card is selected at random from these coloured digit cards.



Write down the cards that could be selected if

a the number on the card is at least 3

b the card is blue

c the card is not yellow

d the card is blue and the number is even

8 A normal dice is thrown. List the numbers that could be thrown if

a an odd number is scored

b a prime number is scored

c the score is less than 5

d the score is not less than 5

e at least 2 is scored

explanation 2 — online

9 Work out the probability of each part of question **8**.

10 **a** Explain why the probability that this spinner lands on 5 is $\frac{1}{6}$.

b Explain why the probability that this spinner lands on green is $\frac{1}{3}$.

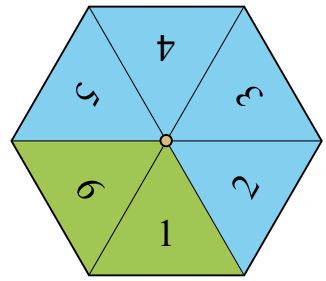
c Find the probability that this spinner lands on

i blue

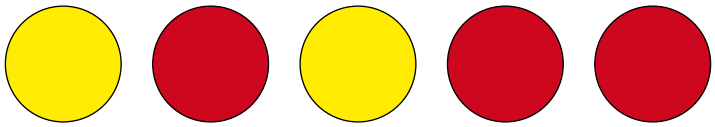
ii any number apart from 4

iii a blue odd number

iv a number that is 4 or more



11 These counters are put into a bag and one is selected at random.



a What is the probability that the counter selected is red?

b What is the probability that the selected counter is red or yellow?

c What is the probability that the selected counter is blue?

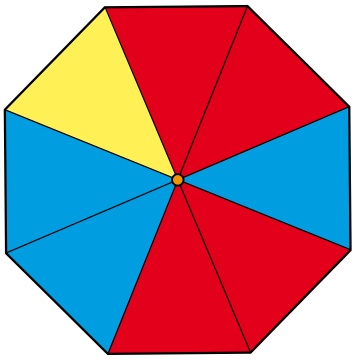
12 Look at your answers to questions **10** and **11**.

a What is the probability of something that is certain to happen?

b What is the probability of something that cannot happen?

c What is the probability for an even chance?

13 **a** Find the probability as a fraction in its lowest terms that this spinner lands on



i yellow

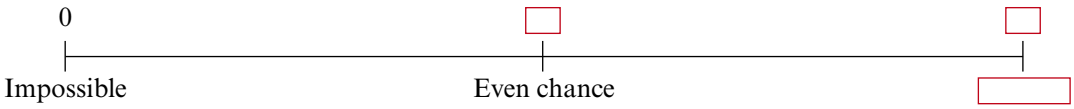
ii red

iii blue

iv purple

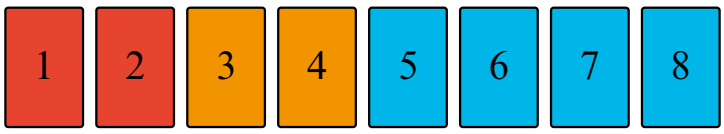
v yellow or red or blue

b Copy and complete this probability scale.



c Mark your answers to part **a** on the probability scale.

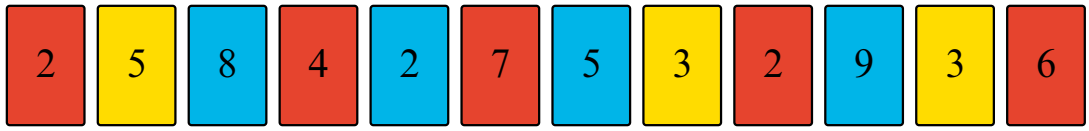
14 A card is selected at random from these coloured digit cards.



Find the probability that the card chosen is

a blue **b** red **c** not red

15 Charlotte has twelve cards from a pack of cards.



She picks a card at random. Find the probability as a fraction in its lowest terms that she picks a

a red card
b blue card
c card showing 2
d card showing 6
e card that is not blue
f card showing an even number

16 A bag contains six yellow counters and four blue counters. The counters are identical apart from their colour. One counter is selected at random.

Find the probability that the counter chosen is

a yellow **b** blue **c** yellow or blue

17 A box of tiles contains five red tiles, four black tiles and six white tiles.

One tile is selected at random.

Find the probability that the tile selected is

a red
b white
c red or black
d not red

18 The local weather forecast gives the probability that it will rain in Manchester today as $\frac{1}{4}$. What is the probability that it will not rain in Manchester today?

19 The probability of a local football team winning their next match is $\frac{2}{3}$. What is the probability that they don't win their next match?

20 The probability that the bus is late is $\frac{2}{3}$ and the probability that it is on time is $\frac{1}{6}$. What is the probability that the bus is early?