# PROBABILITY

## A OUTCOME

### A.1 LISTING ALL POSSIBLE OUTCOMES

**MCQ 1:** Look at this die:  . If you roll it, what are all the possible outcomes?

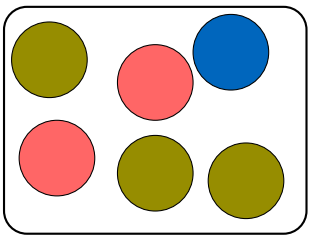
☐ 1, 2, 3, 4, 5

☐ 1, 2, 3, 4, 5, 6, 7

☐ 1, 2, 3, 4, 5, 6

**MCQ 2:** Imagine a bag with balls: 2 red, 1 blue, and 3 green. If you pick one ball without looking, what are all the possible colors you could get?

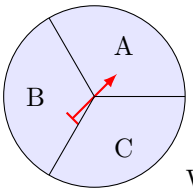
Bag



☐ Red, Blue, Green

☐ 2 Red, 1 Blue, 3 Green

☐ Red, Red, Blue, Green, Green, Green

**MCQ 3:** Look at this spinner: 

What are all the possible letters it could land on?

☐ A, B

☐ A, C

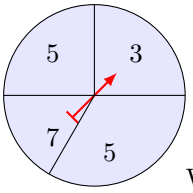
☐ A, B, C

**MCQ 4:** If you pick a letter from the word "PAPA," what are all the possible letters you could pick?

☐ P, A, P, A

☐ P, A, P

☐ P, A

**MCQ 5:** Look at this spinner: 

What are all the possible numbers it could land on?

☐ 3, 5, 7, 7

☐ 3, 5, 5, 7

☐ 3, 5, 7

**MCQ 6:** A couple is expecting a baby. They don't know if it will be a boy or a girl. What are all the possible outcomes for the baby's gender?

☐ Boy

☐ Girl, Boy

☐ Girl

**MCQ 7:** If you pick a letter from the word "APPLE," what are all the possible letters you could pick?

☐ P, A, L, E

☐ P, P, A, L, E

☐ A, P, L

☐ A, L, E, P, P

**MCQ 8:** If you pick a letter randomly from the word "BANANA," what are all the possible letters you could pick?

☐ B, N, A

☐ B, A, N, A, N, A

☐ A, B, N, A, B, N

## B EVENT

### B.1 IDENTIFYING OUTCOMES FOR DIE-ROLLING EVENTS

**MCQ 9:** If you roll a die, what are the outcomes for the event "getting a 3"?

☐ 1, 3, 5

☐ 2, 3, 4

☐ 1, 2, 3

☐ 3

**MCQ 10:** If you roll a die, what are the outcomes for the event "getting a 5 or 6"?

☐ 5, 6

☐ 4, 5, 6

☐ 1, 2, 3

☐ 3, 4, 5

**MCQ 11:** If you roll a die, what are the outcomes for the event "not getting a 6"?

☐ 2, 3, 4

☐ 1, 2, 3, 4, 5, 6

☐ 1, 2, 3, 4, 5

☐ 1, 3, 5

**MCQ 12:** If you roll a die, what are the outcomes for the event "getting a number greater than or equal to 4"?

☐ 1, 2, 3

☐ 4, 5, 6

☐ 3, 4, 5

☐ 2, 3, 4

**MCQ 13:** If you roll a die, what are the outcomes for the event "even number"?

☐ 1, 3, 5

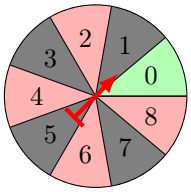
☐ 2, 4, 6

☐ 1, 2, 3, 4, 5, 6

☐ 2, 3, 4, 5

### B.2 IDENTIFYING OUTCOMES IN A CASINO SPINNER

**MCQ 14:** If you spin the spinner below, what are the outcomes for the event "getting a 2"?



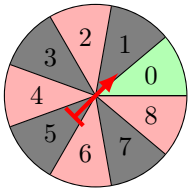

☐ 2

☐ 1, 2, 3

☐ 2, 4, 6

☐ 0, 1, 2

**MCQ 15:** If you spin the spinner below, what are the outcomes for the event "not getting a 4"?



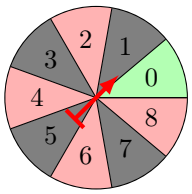

☐ 1, 2, 3, 4

☐ 0, 1, 2, 3, 5, 6, 7, 8

☐ 2, 4, 6, 8

☐ 4, 5, 6

**MCQ 16:** If you spin the spinner below, what are the outcomes for the event "red"?



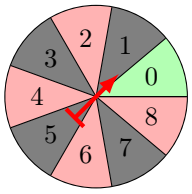

☐ 1, 3, 5, 7

☐ 0

☐ 2, 4, 6, 8

☐ 1, 2, 3, 4

**MCQ 17:** If you spin the spinner below, what are the outcomes for the event "getting an odd number"?




☐ 0, 1, 3

☐ 2, 4, 6, 8

☐ 1, 2, 3, 4

☐ 1, 3, 5, 7

## C USING WORDS TO DESCRIBE PROBABILITY

### C.1 FINDING THE PROBABILITY IN A DRAWING EXPERIMENT

**MCQ 18:** What is the chance of picking a red candy from a bag with 4 red candies and 4 blue candies?

**Choose one answer:**

☐ Impossible

☐ Less Likely

☐ Even Chance

☐ Most Likely

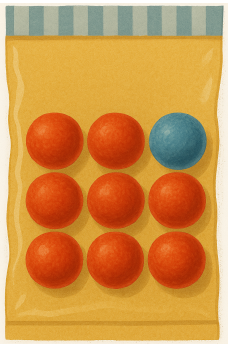
☐ Certain

**MCQ 19:** What is the chance of picking a blue candy from a bag with 4 red candies and 4 blue candies?

**Choose one answer:**

- ☐ Impossible
- ☐ Less Likely
- ☐ Even Chance
- ☐ Most Likely
- ☐ Certain

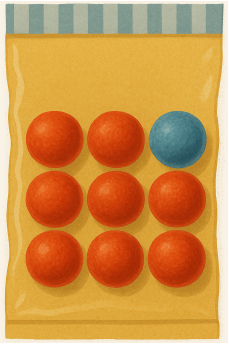
**MCQ 20:** What is the chance of picking a blue candy from a bag with 9 red candies and 1 blue candy?



**Choose one answer:**

- ☐ Impossible
- ☐ Less Likely
- ☐ Even Chance
- ☐ Most Likely
- ☐ Certain

**MCQ 21:** What is the chance of picking a red candy from a bag with 9 red candies and 1 blue candy?

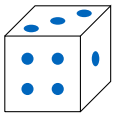


**Choose one answer:**

- ☐ Impossible
- ☐ Less Likely
- ☐ Even Chance
- ☐ Most Likely
- ☐ Certain

## C.2 FINDING THE PROBABILITY IN A DICE EXPERIMENT

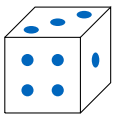
**MCQ 22:** What is the chance of getting a 3 when you roll a die?



**Choose one answer:**

- ☐ Impossible
- ☐ Less Likely
- ☐ Even Chance
- ☐ Most Likely
- ☐ Certain

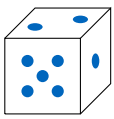
**MCQ 23:** What is the chance of **not** getting a 3 when you roll a die?



**Choose one answer:**

- ☐ Impossible
- ☐ Less Likely
- ☐ Even Chance
- ☐ Most Likely
- ☐ Certain

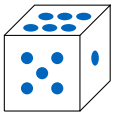
**MCQ 24:** What is the chance of getting an even number (2, 4, or 6) when you roll a die?



**Choose one answer:**

- ☐ Impossible
- ☐ Less Likely
- ☐ Even Chance
- ☐ Most Likely
- ☐ Certain

**MCQ 25:** What is the chance of getting a 7 when you roll a die?



**Choose one answer:**

☐ Impossible

☐ Less Likely

☐ Even Chance

☐ Most Likely

☐ Certain

# D USING NUMBERS TO QUANTIFY PROBABILITY

## D.1 DESCRIBING PROBABILITIES WITH WORDS

**MCQ 26:** The probability of winning a game is $\frac{1}{10}$. Find the word to describe this probability.

☐ Impossible

☐ Less Likely

☐ Even Chance

☐ Most Likely

☐ Certain

**MCQ 27:** The probability of winning a game is $\frac{4}{5}$. Find the word to describe this probability.

☐ Impossible

☐ Less Likely

☐ Even Chance

☐ Most Likely

☐ Certain

**MCQ 28:** The probability of winning a game is $\frac{1}{2}$. Find the word to describe this probability.

☐ Impossible

☐ Less Likely

☐ Even Chance

☐ Most Likely

☐ Certain

**MCQ 29:** The probability of winning a game is 0. Find the word to describe this probability.

☐ Impossible

☐ Less Likely

☐ Even Chance

☐ Most Likely

☐ Certain

**MCQ 30:** The probability of winning a game is 1. Find the word to describe this probability.

☐ Impossible

☐ Less Likely

☐ Even Chance

☐ Most Likely

☐ Certain

## D.2 MAKING DECISIONS USING PROBABILITIES

**MCQ 31:** Louis advises you to play because the probability of winning this game is $\frac{3}{4}$. Do you follow his advice?

☐ Yes

☐ No

**MCQ 32:** Louis advises you to play because the probability of winning this game is $\frac{1}{4}$. Do you follow his advice?

☐ Yes

☐ No

**MCQ 33:** The probability of succeeding a penalty is $\frac{1}{2}$ for Louis and $\frac{3}{4}$ for Hugo. Which player do you choose to take the penalty?

☐ Louis

☐ Hugo

**MCQ 34:** The probability of succeeding a penalty is $\frac{1}{4}$ for Louis and $\frac{3}{5}$ for Hugo. Which player do you choose to take the penalty?

☐ Louis

☐ Hugo

# E CALCULATING PROBABILITIES

## E.1 CALCULATING PROBABILITIES

**Ex 35:** A ball is selected at random from a bag containing a total of 2 red balls and 3 blue balls.
Calculate the probability that the selected ball is a red ball.

$$P(\text{"choosing a red ball"}) = \frac{\square}{\square}$$

**Ex 36:** A ball is selected at random from a bag containing a total of 2 red balls and 3 blue balls.
Calculate the probability that the selected ball is a blue ball.

$$P(\text{"choosing a blue ball"}) = \frac{\square}{\square}$$

**Ex 37:** A fruit is selected at random from a basket containing a total of 3 apples, 2 oranges, and 5 bananas.
Calculate the probability that the selected fruit is an apple.

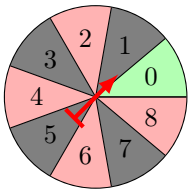
$$P(\text{"selecting an apple"}) = \frac{\square}{\square}$$

**Ex 38:** In our class, there are 10 students including you. What is the probability the teacher selects you when the teacher chooses a student at random?

$$P(\text{"being selected"}) = \frac{\square}{\square}$$

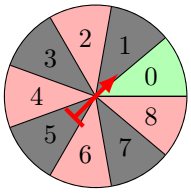
## E.2 CALCULATING PROBABILITIES ON A CASINO SPINNER

**Ex 39:** You spin the casino spinner shown below. Calculate the probability of the event "getting a 2".



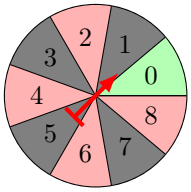

$$P(\text{"getting a 2"}) = \frac{\square}{\square}$$

**Ex 40:** You spin the casino spinner shown below. Calculate the probability of the event "not getting a 4".



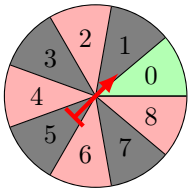

$$P(\text{"not getting a 4"}) = \frac{\square}{\square}$$

**Ex 41:** You spin the casino spinner shown below. Calculate the probability of the event "red".




$$P(\text{"red"}) = \frac{\square}{\square}$$

**Ex 42:** You spin the casino spinner shown below. Calculate the probability of the event "getting an odd number".




$$P(\text{"getting an odd number"}) = \frac{\square}{\square}$$

# F EXPRESSING PROBABILITIES IN DIFFERENT FORMS

## F.1 CALCULATING PROBABILITIES IN DECIMAL FORM

**Ex 43:** In a classroom game, Liam draws a marble from a bag containing 10 marbles: 2 green, 3 red, and 5 blue. Calculate the probability that Liam draws a green marble, and express the result in decimal form.

$$P(\text{"drawing a green marble"}) = \square$$

**Ex 44:** In a school raffle, there are a total of 50 tickets. Emma has 1 of those tickets. Calculate the probability that Emma wins the raffle, and express the result in decimal form.

$$P(\text{"drawing Emma's ticket"}) = \square$$

**Ex 45:** In a classroom game, Noah picks a card from a deck containing 20 cards, each labeled with a different number from 1 to 20. Calculate the probability that Noah picks the card labeled "7", and express the result in decimal form.

$$P(\text{"picking the card labeled 7"}) = \square$$

**Ex 46:** Sofia spins a spinner divided into 5 equal sections: 3 yellow and 2 blue. Calculate the probability that the spinner lands on a yellow section, and express the result in decimal form.

$$P(\text{"yellow section"}) = \square$$

## F.2 CALCULATING PROBABILITIES IN PERCENTAGE FORM

**Ex 47:** In a classroom game, Mia draws a marble from a bag containing marbles: 5 yellow, 10 red, and 10 blue. Calculate the probability that Mia draws a yellow marble, and express the result in percentage form.

$$P(\text{"drawing a yellow marble"}) = \square\ \%$$

**Ex 48:** In a classroom activity, Aisha picks a candy from a jar containing 20 candies: 8 chocolate, 6 vanilla, and 6 strawberry. Calculate the probability that Aisha picks a chocolate candy, and express the result in percentage form.

$$P(\text{"picking a chocolate candy"}) = \square\%$$

**Ex 49:** In a classroom game, Ethan spins a spinner divided into 10 equal sections, numbered 1 to 10. Calculate the probability that the spinner lands on an even number, and express the result in percentage form.

$$P(\text{"landing on an even number"}) = \square\%$$

**Ex 50:** In a classroom game, Zara picks a fruit from a basket containing 30 fruits: 6 oranges, 12 apples, and 12 bananas. Calculate the probability that Zara picks an orange, and express the result in percentage form.

$$P(\text{"picking an orange"}) = \square\%$$

# G EXPERIMENTAL PROBABILITY

## G.1 CALCULATING EXPERIMENTAL PROBABILITIES IN PERCENTAGE FORM

**Ex 51:** During a classroom experiment, Ethan flips a coin 50 times and records that it lands on heads 30 times. Calculate the experimental probability that the coin lands on heads, and express the result in percentage form.

$$P(\text{"landing on heads"}) \approx \square\ \%$$

**Ex 52:** During a week of basketball practice, Mia made 45 out of 60 free-throw attempts. Estimate the experimental probability that Mia will make her next free-throw attempt, and express the result in percentage form.

$$P(\text{"making the next attempt"}) \approx \square\%$$

**Ex 53:** During a week, the school cafeteria recorded that out of 150 students, 120 chose a vegetarian meal. Estimate the experimental probability that the next student will choose a vegetarian meal, and express the result in percentage form.

$$P(\text{choosing a vegetarian meal}) \approx \square\%$$

**Ex 54:** Over the course of a year, it rained on 146 days out of 365 recorded days. Estimate the experimental probability that it will rain, and express the result in percentage form.

$$P(\text{"raining"}) \approx \square\%$$

## G.2 CONDUCTING EXPERIMENTS TO ESTIMATE PROBABILITIES

**Ex 55:** In a experiment, you are asked to toss a fair coin at least 30. Follow these steps:

1. Note the number of times the coin lands on heads.
2. Note the total number of trials (tosses).
3. Calculate the experimental probability that the coin lands on heads, and express the result in decimal form.

**Ex 56:** In a classroom experiment, you are asked of your friends at least 10 to choose randomly a single number from 1, 2, 3, 4, or 5. Follow these steps:

1. Note the number of times the answer is 5.
2. Note the total number of trials (friends asked).
3. Calculate the experimental probability that a friend chooses the number 5, and express the result in decimal form.