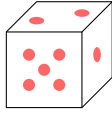


# PROBABILITY

## A SAMPLE SPACES

### A.1 FINDING THE SAMPLE SPACES

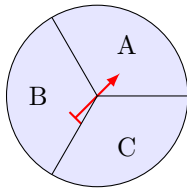
**MCQ 1:** A fair six-sided die is rolled once.



Find the sample space.

- ☐ {1, 2, 3, 4, 5}
- ☐ {1, 2, 3, 4, 5, 6, 7}
- ☐ {1, 2, 3, 4, 5, 6}

**MCQ 2:** You spin the arrow on the spinner below.

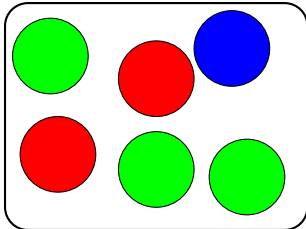


Find the sample space.

- ☐ {A, B, C}
- ☐ {A, B}
- ☐ {A, C}

**MCQ 3:** A ball is chosen randomly from a bag containing 2 red balls, 1 blue ball, and 3 green balls.

Bag



Find the sample space.

- ☐ {Red, Blue, Green}
- ☐ {2 Red, 1 Blue, 3 Green}
- ☐ {Red, Red, Blue, Green, Green, Green}

**MCQ 4:** A letter is chosen randomly from the word BANANA. Find all possible outcomes for the chosen letter.

- ☐ {B, N, A}
- ☐ {B, A, N, A, N, A}
- ☐ {A, B, N, A, B, N}

**MCQ 5:** A couple is expecting a baby. What is the sample space for this random experiment?

- ☐ {boy, girl}
- ☐ {boy}
- ☐ {girl}

## B EVENTS

### B.1 FINDING EVENTS FOR DIE-ROLLING EVENTS

**MCQ 6:** If you roll a die, what is the set of outcomes for the event "getting a 3"?

- ☐ {1, 3, 5}
- ☐ {2, 3, 4}
- ☐ {1, 2, 3}
- ☐ {3}

**MCQ 7:** If you roll a die, what is the set of outcomes for the event "getting a 5 or 6"?

- ☐ {5, 6}
- ☐ {4, 5, 6}
- ☐ {1, 2, 3}
- ☐ {3, 4, 5}

**MCQ 8:** If you roll a die, what is the set of outcomes for the event "getting a number greater than or equal to 4"?

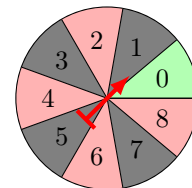
- ☐ {1, 2, 3}
- ☐ {4, 5, 6}
- ☐ {3, 4, 5}
- ☐ {2, 3, 4}

**MCQ 9:** If you roll a die, what is the set of outcomes for the event "even number"?

- ☐ {1, 3, 5}
- ☐ {2, 4, 6}
- ☐ {1, 2, 3, 4, 5, 6}
- ☐ {2, 3, 4, 5}

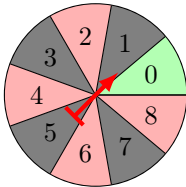
### B.2 FINDING EVENTS IN A CASINO SPINNER

**MCQ 10:** If you spin the spinner below, what is the set of outcomes for the event "getting a 2"?



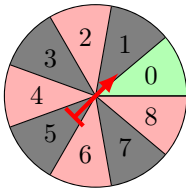
- ☐ {2}
- ☐ {1, 2, 3}
- ☐ {2, 4, 6}
- ☐ {0, 1, 2}

**MCQ 11:** If you spin the spinner below, what is the set of outcomes for the event "red"?



- ☐ {1, 3, 5, 7}
- ☐ {0}
- ☐ {2, 4, 6, 8}
- ☐ {1, 2, 3, 4}

**MCQ 12:** If you spin the spinner below, what is the set of outcomes for the event "getting an odd number"?



- ☐ {0, 1, 3}
- ☐ {2, 4, 6, 8}
- ☐ {1, 2, 3, 4}
- ☐ {1, 3, 5, 7}

## C COMPLEMENTARY EVENTS

### C.1 FINDING THE COMPLEMENTARY EVENTS

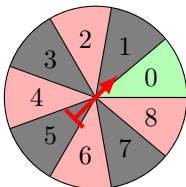
**MCQ 13:** If you roll a die, what is the set of outcomes for the event "not getting a 6"?

- ☐ {2, 3, 4}
- ☐ {1, 2, 3, 4, 5, 6}
- ☐ {1, 2, 3, 4, 5}
- ☐ {1, 3, 5}

**MCQ 14:** If you roll a die, what is the set of outcomes for the event "not getting an odd number"?

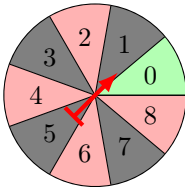
- ☐ {2, 4, 6}
- ☐ {1, 2, 3, 4, 5, 6}
- ☐ {1, 2, 3}
- ☐ {1, 3, 5}

**MCQ 15:** If you spin the spinner below, what is the set of 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 is the set of outcomes for the event "not getting red"?



- ☐ {0, 1, 3, 5, 7}
- ☐ {2, 4, 6, 8}
- ☐ {1, 2, 3, 4, 5, 6, 7, 8}
- ☐ {0}

## D USING WORDS TO DESCRIBE PROBABILITY

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

**MCQ 17:** 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 18:** What is the chance of picking a blue candy from a bag with 4 red candies and 4 blue candies?

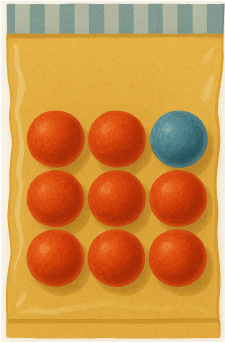




Choose one answer:

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

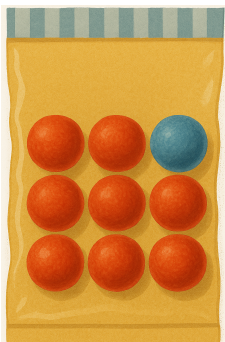
**MCQ 19:** What is the chance of picking a blue candy from a bag with 9 red candies and 1 blue candy?



Choose one answer:

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

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



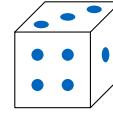
Choose one answer:

- ☐ Impossible

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

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

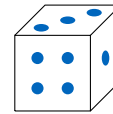
**MCQ 21:** What is the chance of getting a 3 when you roll a die?



Choose one answer:

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

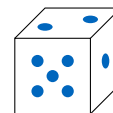
**MCQ 22:** What is the chance of **not** getting a 3 when you roll a die?



Choose one answer:

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

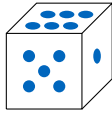
**MCQ 23:** What is the chance of getting an even number (2, 4, or 6) when you roll a die?



Choose one answer:

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

**MCQ 24:** What is the chance of getting a 7 when you roll a die?



Choose one answer:

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

## E PROBABILITY

### E.1 DESCRIBING PROBABILITIES WITH WORDS

**MCQ 25:** 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 26:** 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 27:** 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 28:** The probability of winning a game is 0. Find the word to describe this probability.

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

**MCQ 29:** The probability of winning a game is 1. Find the word to describe this probability.

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

### E.2 MAKING DECISIONS USING PROBABILITIES

**MCQ 30:** Louis advises you to play because the probability of winning this game is  $\frac{3}{4}$ . Do you follow his advice?

- ☐ Yes
- ☐ No

**MCQ 31:** Louis advises you to play because the probability of winning this game is  $\frac{1}{4}$ . Do you follow his advice?

- ☐ Yes
- ☐ No

**MCQ 32:** 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

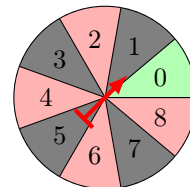
**MCQ 33:** The probability of succeeding a penalty is  $\frac{1}{4}$  for Louis and  $\frac{3}{5}$  for Hugo. Which player do you choose to take the penalty?

- ☐ Louis
- ☐ Hugo

## F EQUALLY LIKELY

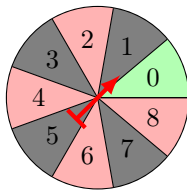
### F.1 FINDING PROBABILITIES IN A CASINO SPINNER

**Ex 34:** You spin the casino spinner shown below. Calculate the probability of the event "getting a 2".



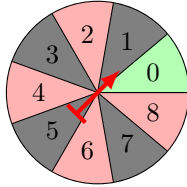
$$P(\text{"getting a 2"}) = \boxed{\phantom{00}}$$

**Ex 35:** You spin the casino spinner shown below. Calculate the probability of the event "not getting a 4".



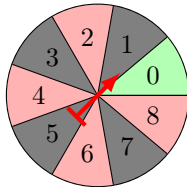
$$P(\text{"not getting a 4"}) = \boxed{\phantom{00}}$$

**Ex 36:** You spin the casino spinner shown below. Calculate the probability of the event "red".



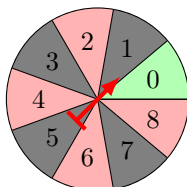
$$P(\text{"red"}) = \boxed{\phantom{00}}$$

**Ex 37:** You spin the casino spinner shown below. Calculate the probability of the event "getting an odd number".



$$P(\text{"getting an odd number"}) = \boxed{\phantom{00}}$$

**Ex 38:** You spin the casino spinner shown below. Calculate the probability of the event "not getting red".



$$P(\text{"not getting red"}) = \boxed{\phantom{00}}$$

## F.2 FINDING PROBABILITIES IN A DICE EXPERIMENT

**Ex 39:** If you roll a die, what is the probability of the event "getting a 3"?

$$P(\text{"getting a 3"}) = \boxed{\phantom{00}}$$

**Ex 40:** If you roll a die, what is the probability of the event "getting a 5 or 6"?

$$P(\text{"getting a 5 or 6"}) = \boxed{\phantom{00}}$$

**Ex 41:** If you roll a die, what is the probability of the event "getting a number greater than or equal to 4"?

$$P(\text{"number"} \geq 4) = \boxed{\phantom{00}}$$

**Ex 42:** If you roll a die, what is the probability of the event "even number"?

$$P(\text{"even number"}) = \boxed{\phantom{00}}$$

**Ex 43:** If you roll a die, what is the probability of the event "not getting a 6"?

$$P(\text{"not getting a 6"}) = \boxed{\phantom{00}}$$

**Ex 44:** If you roll a die, what is the probability of the event "not getting an odd number"?

$$P(\text{"not getting an odd number"}) = \boxed{\phantom{00}}$$

## G COMPLEMENT RULE

### G.1 APPLYING THE COMPLEMENT RULE

**Ex 45:** I toss a fair coin. The probability of getting heads is  $\frac{1}{2}$ . Find the probability of getting tails.

$$P(\text{"Getting tails"}) = \boxed{\phantom{00}}$$

**Ex 46:** A teacher told a joke in class: "Why was the math book sad? Because it had too many problems!" The probability that a student laughs at the joke is 70%. Find the probability that a student does not laugh at the joke.

$$P(\text{"Not laughing"}) = \boxed{\phantom{00}}\%$$

**Ex 47:** I randomly select a student in the class. The probability that a girl is selected is  $\frac{9}{10}$ . Find the probability that a boy is selected.

$$P(\text{"Selecting a boy"}) = \boxed{\phantom{00}}$$

**Ex 48:** The weather forecast predicts that there is a 70% chance of rain tomorrow. Find the probability that it will not rain tomorrow.


$$P(\text{"No rain"}) = \boxed{\phantom{00}}\%$$

**Ex 49:** In a lotto game, the probability of winning is  $\frac{1}{100}$ . Find the probability of losing.


$$P(\text{"Losing"}) = \boxed{\phantom{00}}$$

## H EXPERIMENTAL PROBABILITY


### H.1 CALCULATING EXPERIMENTAL PROBABILITIES IN PERCENTAGE FORM

**Ex 50:**  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.


$$P(\text{"landing on heads"}) \approx \boxed{\phantom{00}} \%$$

**Ex 51:**  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.

$$P(\text{"making the next attempt"}) \approx \boxed{\phantom{00}} \%$$


**Ex 52:**  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.

$$P(\text{choosing a vegetarian meal}) \approx \boxed{\phantom{00}} \%$$


**Ex 53:**  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.

$$P(\text{"raining"}) \approx \boxed{\phantom{00}} \%$$

### H.2 CONDUCTING EXPERIMENTS TO ESTIMATE PROBABILITIES

**Ex 54:**  In an 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 55:**  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.