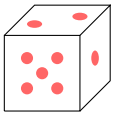
# PROBABILITY

## A SAMPLE SPACE

### A.1 FINDING THE SAMPLE SPACES

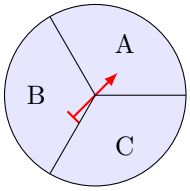
**MCQ 1:** A fair six-sided die is rolled once.



Find the sample space.

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

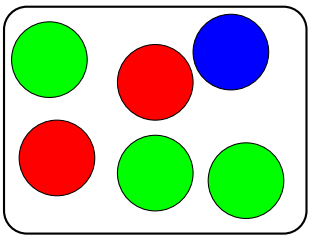
**MCQ 2:** Find the sample space that the spinner can land on:




- ☐ $\{A, B, C\}$
- ☐ $\{A, B\}$
- ☐ $\{A, C\}$

**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}

## B EVENTS

### B.1 FINDING THE EVENTS

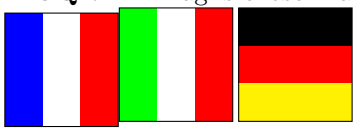
**MCQ 5:** A letter is chosen randomly from the word ORANGE. Find the event where the chosen letter is a vowel.

- ☐ {O, R, A, N, G, E}
- ☐ {O, A, E}
- ☐ {R, G, N}
- ☐ {A, G, E}

**MCQ 6:** A fair six-sided dice is rolled once.
Find the event where the outcome is an even number.

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

**MCQ 7:** A flag is chosen randomly from:

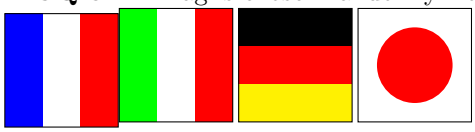


France Italy Germany

Find the event where the outcome is a flag with blue in them.

- ☐ {France }
- ☐ {Italy, France}
- ☐ {Italy, France, Germany}

**MCQ 8:** A flag is chosen randomly from:



France Italy Germany Japan

Find the event where the outcome is a flag with red in them.

- ☐ {France, Japan}
- ☐ {Italy, France}
- ☐ {Italy, France, Germany, Japan}

**MCQ 9:** A flag is chosen randomly from:

France Italy Germany Nigeria

Find the event where the outcome is a flag with green in them.

- ☐ {France, Nigeria}
- ☐ {Italy, Nigeria}
- ☐ {Italy, France, Germany}

# C COMPLEMENTARY EVENT

## C.1 FINDING THE COMPLEMENTARY EVENTS

**MCQ 10:** A flag is chosen randomly from the following:

France Italy Germany Nigeria

Let $E$ be the event where the selected flag contains green.
Find the complement of event $E$, denoted as $E'$.

☐ $E' = \{\text{France, Germany}\}$

☐ $E' = \{\text{Italy, Nigeria}\}$

☐ $E' = \{\text{Italy, France, Germany}\}$

**MCQ 11:** A flag is chosen at random from the following set:

France Italy Germany Nigeria

Let $E$ be the event where the chosen flag contains the color red.
Find the complement of event $E$, denoted $E'$.

☐ $E' = \{\text{France, Germany}\}$

☐ $E' = \{\text{Nigeria}\}$

☐ $E' = \{\text{Italy, France, Germany}\}$

**MCQ 12:** A child's name is chosen randomly from the following list:

- Emily (girl's name)
- James (boy's name)
- Ava (girl's name)
- Sophia (girl's name)

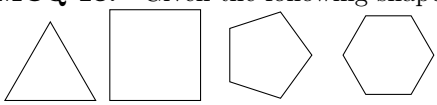
Let $E$ be the event where the selected name is a boy's name.
Find the complement of event $E$, denoted as $E'$.

☐ $E' = \{\text{Emily, Ava, Sophia}\}$

☐ $E' = \{\text{James}\}$

☐ $E' = \{\text{James, Ava}\}$

**MCQ 13:** Given the following shapes:



Triangle Square Pentagon Hexagon

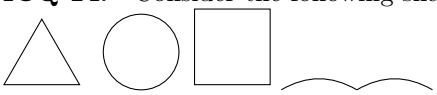
Let $E$ be the event where a polygon with an even number of sides is chosen.
Find the complement of event $E$, denoted as $E'$.

☐ $E' = \{\text{Square, Hexagon}\}$

☐ $E' = \{\text{Triangle, Pentagon}\}$

☐ $E' = \{\text{Triangle, Square, Pentagon, Hexagon}\}$

**MCQ 14:** Consider the following shapes:



Triangle Circle Square Curve

Let $E$ be the event where the shape is a polygon.
Find the complement of event $E$, denoted as $E'$.

☐ $E' = \{\text{Triangle, Square}\}$

☐ $E' = \{\text{Triangle, Circle, Square, Curve}\}$

☐ $E' = \{\text{Circle, Curve}\}$

# D PROBABILITY

## D.1 DETERMINING THE PROBABILITY

**MCQ 15:** Keziah eats rice often. Let $E$ be the event that Keziah eats rice this week. Find $P(E)$, the probability that Keziah eats rice this week.

☐ $P(E) = 1\%$

☐ $P(E) = 50\%$

☐ $P(E) = 99\%$

**MCQ 16:** Emily drinks water every day. Let $E$ be the event that Emily drinks water tomorrow. Find $P(E)$, the probability that Emily drinks water tomorrow.

☐ $P(E) = 50\%$

☐ $P(E) = 90\%$

☐ $P(E) = 100\%$

**MCQ 17:** It almost never snows in July in the Sahara Desert. Let $E$ be the event that it snows this July in the Sahara Desert. Find $P(E)$, the probability that it snows this July.

☐ $P(E) = 0.01\%$

☐ $P(E) = 5\%$

☐ $P(E) = 99.9\%$

**MCQ 18:** Samuel loves playing basketball. Let $E$ be the event that Samuel plays basketball this weekend. Find $P(E)$, the probability that Samuel plays this weekend.

☐ $P(E) = 5\%$

☐ $P(E) = 20\%$

☐ $P(E) = 90\%$

**MCQ 19:** Benjamin rolls a die. Let $E$ be the event that Benjamin rolls a number bigger than 7. Find $P(E)$, the probability that Benjamin rolls a number bigger than 7.

☐ $P(E) = 0\%$

☐ $P(E) = 50\%$

☐ $P(E) = 100\%$

# E CALCULATE PROBABILITIES

## E.1 DETERMINING THE PROBABILITY

**Ex 20:** A ball is chosen randomly from a bag containing 2 red balls, 3 blue balls.
Find the probability that we choose a red ball.

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

**Ex 21:** A card is drawn at random from a standard deck of 52 playing cards. Determine the probability of drawing an Ace and express your answer as a simplified fraction.

$$P(\text{"drawing an Ace"}) = \frac{\square}{\square}$$

**Ex 22:** A six-sided die is rolled once. Determine the probability of obtaining an even number.

$$P(\text{"rolling an even number"}) = \frac{\square}{\square}$$

**MCQ 23:** A fruit is selected randomly from a basket containing 3 apples, 2 oranges, and 5 bananas.
Find the probability that the selected fruit is an orange (simplify the fraction).

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

# F COMPLEMENT RULE

## F.1 APPLYING THE COMPLEMENT RULE

**Ex 24:** I toss a fair coin. The probability of getting heads is $\frac{1}{2}$.
Find the probability of getting tails.

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

**Ex 25:** 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.

$$P(\text{"Not laughing"}) = \square\%$$

**Ex 26:** 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.

$$P(\text{"Selecting a boy"}) = \frac{\square}{\square}$$

**Ex 27:** The weather forecast predicts that there is a 70% chance of rain tomorrow.
Find the probability that it will not rain tomorrow.

$$P(\text{"No rain"}) = \square\%$$

**Ex 28:** A survey shows that 70% of the students in a school love Math.
Find the probability that a randomly chosen student does not love Math.

$$P(\text{"Not loving Math"}) = \square\%$$

**MCQ 29:** 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.

- ☐ $P(\text{"Not laughing"}) = 30\%$
- ☐ $P(\text{"Not laughing"}) = 70\%$
- ☐ $P(\text{"Not laughing"}) = 50\%$

# G EXPERIMENTAL PROBABILITY

## G.1 SOLVING REAL-WORLD PROBLEMS

**Ex 30:** 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.

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

**Ex 31:** During a week, the school cafeteria recorded that out of 150 students, 120 chose a vegetarian meal. Estimate the probability that the next student will choose a vegetarian meal based on this experimental probability.

$$P(\text{"Choosing a Vegetarian meal"}) \approx \square\ \%$$

**Ex 32:** Over the course of a year, it rained on 120 days out of 300 recorded days. Estimate the experimental probability that it will rain.

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

**Ex 33:** A local bakery found that out of 200 customers, 150 ordered a croissant. Estimate the experimental probability that the next customer will order a croissant.

$$P(\text{"Ordering a croissant"}) \approx \square\ \%$$