PROBABILITY

A OUTCOME

A.1 LISTING ALL POSSIBLE OUTCOMES

MCQ 1: Look at this die:  . If you roll it, what are all the possible numbers you could get?

☐ 1, 2, 3, 4, 5

☐ 1, 2, 3, 4, 5, 6, 7

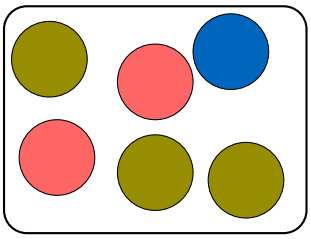
☒ 1, 2, 3, 4, 5, 6

Answer:

- A die has six sides, numbered 1 to 6.
- So, all possible outcomes are: 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



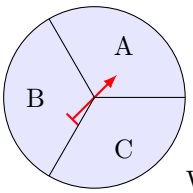
☒ Red, Blue, Green

☐ 2 Red, 1 Blue, 3 Green

☐ Red, Red, Blue, Green, Green, Green

Answer:

- The possible outcomes are the different colors: Red, Blue, Green.
- We don't list the same color more than once because we're looking for possible colors, not how many of each.

MCQ 3: Look at this spinner: 

What are all the possible letters it could land on?

☐ A, B

☐ A, C

☒ A, B, C

Answer:

- The spinner has three sections: A, B, and C.
- So, the possible outcomes are A, B, and C.

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

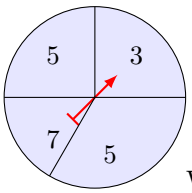
☐ P, A, P, A

☐ P, A, P

☒ P, A

Answer:

- The distinct letters in "PAPA" are P and A.
- So, the possible outcomes are P and 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

Answer:

- The spinner has sections with numbers 3, 5, 7, and another 5.
- But for outcomes, we list each different number once: 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

Answer:

- The possible outcomes are: Girl, Boy.

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

Answer:

- The distinct letters in "APPLE" are P, A, L, E.

- So, the possible outcomes are P, A, L, E.

MCQ 8: If you pick a letter 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

Answer:

- The distinct letters in "BANANA" are B, A, N.
- So, the possible outcomes can be listed as B, N, A (order doesn't matter).

B EVENTS

B.1 FINDING THE EVENTS

MCQ 9: You pick a letter from "ORANGE." Which letters are vowels?

☐ O, R, A, N, G, E

☒ O, A, E

☐ R, G, N

☐ A, G, E

Answer:

- Vowels in "ORANGE" are O, A, E.

MCQ 10: When you roll a die, which numbers are even?

☐ 1, 3, 5

☒ 2, 4, 6

☐ 1, 2, 3, 4, 5, 6

☐ 2, 3, 4, 5

Answer:

- Even numbers on a die are 2, 4, 6.

MCQ 11: Look at these flags: France, Italy, Germany. Which

flags have blue in them? France Italy Germany

☒ France

☐ Italy, France

☐ Italy, France, Germany

Answer:

- Only France has blue in it.

MCQ 12: Look at these flags: France, Italy, Germany, Japan. Which flags have red in

them? France Italy Germany Japan

☐ France, Japan

☐ Italy, France

☒ Italy, France, Germany, Japan

Answer:

- All four flags have red in them: France, Italy, Germany, Japan.

MCQ 13: Look at these flags: France, Italy, Germany, Nigeria. Which flags have green in

them? France Italy Germany Nigeria

☐ France, Nigeria

☒ Italy, Nigeria

☐ Italy, France, Germany

Answer:

- Italy and Nigeria have green in them.

C USING WORDS TO DESCRIBE PROBABILITY

C.1 DETERMINING THE PROBABILITY

MCQ 14: If you flip a coin, what's the chance it lands on heads?

☐ certain

☐ likely

☒ 50-50 chance

☐ unlikely

☐ impossible

Answer:

- A coin has two sides, heads and tails, equally likely. So, it's a 50-50 chance.

MCQ 15: The weather app says there's a 10% chance of rain tomorrow. What's the probability it rains?

☐ certain

☐ likely

☐ 50-50 chance

☒ unlikely

☐ impossible

Answer:

- 10% is a small chance, so it's unlikely.

MCQ 16: In a class of 30 students, 5 wear glasses. If you pick one student at random, what's the chance they wear glasses?

☐ certain

☐ likely

☐ 50-50 chance

☒ unlikely

☐ impossible

Answer:

- Only 5 out of 30 wear glasses, which is less than half, so it's unlikely.

MCQ 17: What's the chance the sun rises in the west tomorrow?

☐ certain

☐ likely

☐ 50-50 chance

☐ unlikely

☒ impossible

Answer:

- The sun always rises in the east, so it's impossible.

MCQ 18: What's the chance the next baby born at a hospital is a girl?

☐ certain

☐ likely

☒ 50-50 chance

☐ unlikely

☐ impossible

Answer:

- It's equally likely to be a girl or a boy, so it's a 50-50 chance.

MCQ 19: A bag has 5 red marbles and 1 blue marble. If you pick one, what's the chance it's blue?

☐ certain

☐ likely

☐ 50-50 chance

☒ unlikely

☐ impossible

Answer:

- Only 1 out of 6 marbles is blue, so it's unlikely.

MCQ 20: A bag has 19 red marbles and 1 blue marble. If you pick one, what's the chance it's green?

☐ certain

☐ likely

☐ 50-50 chance

☐ unlikely

☒ impossible

Answer:

- There are no green marbles, so it's impossible.

MCQ 21: A bag has 19 red marbles and 1 blue marble. If you pick one, what's the chance it's red?

☐ certain

☒ likely

☐ 50-50 chance

☐ unlikely

☐ impossible

Answer:

- 19 out of 20 marbles are red, which is almost all, so it's likely.

D USING NUMBERS TO QUANTIFY PROBABILITY

D.1 DETERMINING THE PROBABILITY

MCQ 22: Keziah eats rice often. What's the probability he eats rice this week?

☐ 1%

☐ 50%

☒ 99%

Answer:

- Since he eats rice often, it's very likely, so 99%.

MCQ 23: Emily drinks water every day. What's the probability she drinks water tomorrow?

☐ 50%

☐ 90%

☒ 100%

Answer:

- She drinks water every day, so it's certain, 100%.

MCQ 24: It almost never snows in July in the Sahara Desert. What's the probability it snows this July?

☒ 0.01%

☐ 5%

☐ 99.9%

Answer:

- It's extremely rare, so very low, 0.01%.

MCQ 25: Samuel loves playing basketball. What's the probability he plays this weekend?

☐ 5%

☐ 20%

☒ 90%

Answer:

- He loves it, so it's very likely, 90%.

MCQ 26: Benjamin rolls a die. What's the probability he rolls a number bigger than 7?

☒ 0%

☐ 50%

☐ 100%

Answer:

- A die only has numbers 1 to 6, so it's impossible, 0%.

E CALCULATE PROBABILITIES

E.1 DETERMINING THE PROBABILITY

Ex 27: A ball is chosen randomly from a bag containing 2 red balls, 3 blue balls.
Find the probability that we choose a red ball.

$$P(\text{"choosing a red ball"}) = \boxed{\frac{2}{5}}$$

Answer:

- To find the probability of choosing a red ball, divide the number of red balls by the total number of balls.
- $$P(\text{"choosing a red ball"}) = \frac{\text{number of red balls}}{\text{total number of balls}} = \frac{2}{5}$$

Ex 28: 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.

$$P(\text{"drawing an Ace"}) = \boxed{\frac{1}{13}}$$

Answer:

- To find the probability of drawing an Ace, divide the number of Aces by the total number of cards.
- There are 4 Aces in a standard deck of 52 playing cards.
- $$P(\text{"drawing an Ace"}) = \frac{\text{number of Aces}}{\text{total number of cards}} = \frac{4}{52} = \frac{1 \times \cancel{4}}{13 \times \cancel{4}} = \frac{1}{13}$$

Ex 29: A six-sided die is rolled once. Determine the probability of obtaining an even number.

$$P(\text{"rolling an even number"}) = \boxed{\frac{1}{2}}$$

Answer:

- To find the probability of rolling an even number, divide the number of even numbers by the total number of sides.
- There are 3 even numbers on a six-sided die (2, 4, and 6).
- $$P(\text{rolling an even number}) = \frac{\text{number of even numbers}}{\text{total number of sides}} = \frac{3}{6} = \frac{1 \times \cancel{3}}{2 \times \cancel{3}} = \frac{1}{2}$$

MCQ 30: 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).

$$P(\text{"selecting an orange"}) = \boxed{\frac{1}{5}}$$

Answer:

- To find the probability of selecting an orange, divide the number of oranges by the total number of fruits.
- There are 2 oranges out of 10 fruits in total.
- $$P(\text{"selecting an orange"}) = \frac{\text{number of oranges}}{\text{total number of fruits}} = \frac{2}{10} = \frac{1 \times \cancel{2}}{5 \times \cancel{2}} = \frac{1}{5}$$