Basic Probability

Use a sample space to find a basic probability: favourable outcomes over total outcomes.

Name _____ **Date** _____

Show your method

$P(\text{event}) = \dfrac{\text{favourable outcomes}}{\text{total outcomes}}$. A probability is always between 0 (impossible) and 1 (certain).

Worked example A fair 6-sided die is rolled. Find $P(\text{rolling an even number})$.

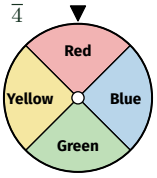
Favourable outcomes: $2, 4, 6$ (there are 3).
Total outcomes: 6.
$P(\text{even}) = \dfrac{3}{6} = \dfrac{1}{2}$

1. A fair die is rolled. What is $P(\text{rolling this number})$?

Solution: $\frac{1}{6}$

2. This spinner has 4 equal sections. What is $P(\text{red})$?

Solution: $\frac{1}{4}$

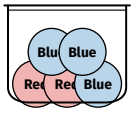


3. A card is drawn from a shuffled deck, then returned before the next draw. What is $P(\text{drawing a King})$?

Solution: $\frac{4}{52} = \frac{1}{13}$

4. This bag has 2 red and 3 blue counters. What is $P(\text{blue})$?

Solution: $\frac{3}{5}$



5. A spinner has 6 equal sections. What is $P(\text{landing on any particular section})$?

Solution: $\frac{1}{6}$

6. State the probability value that means an event is Impossible.

Solution: 0

7. A fair coin is flipped twice. List the sample space (all 4 outcomes).

Solution: HH, HT, TH, TT

8. Using your sample space from Question 7, find $P(\text{both flips land the same})$.

Solution: HH, TT: $\frac{2}{4} = \frac{1}{2}$

9. Express $P = \frac{3}{4}$ as a decimal and a percentage.

Solution: 0.75, 75%

Basic Probability (continued)

Apply theoretical probability, complements, and combined events.

Name _____ **Date** _____

10. A die is rolled 30 times. Theoretically, how many times would you expect a 1?

Solution: $30 \times \frac{1}{6} = 5$

11. A bag has 12 counters: 5 red, 4 blue, 3 green. Find $P(\text{not red})$.

Solution: $\frac{4+3}{12} = \frac{7}{12}$

12. Explain the difference between theoretical and experimental probability.

Solution: Theoretical: calculated from the sample space. Experimental: based on actual trial results.

13. A weather forecast says $P(\text{rain tomorrow}) = 0.15$. Describe this using everyday likelihood language.

Solution: Unlikely

14. Two mutually exclusive events have $P(A) = 0.4$ and $P(B) = 0.25$. Find $P(A \text{ or } B)$.

Solution: $0.4 + 0.25 = 0.65$

15. A die is rolled and a coin flipped. Find $P(\text{rolling a } 3 \text{ AND flipping tails})$.

Solution: $\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$

16. A probability is calculated as -0.2. Explain why this must be wrong.

Solution: Probabilities can never be negative – the minimum is 0.

17. A spinner has $P(\text{red}) = 0.6$. What is $P(\text{not red})$?

Solution: $1 - 0.6 = 0.4$

18. A card is drawn from a standard deck. Find $P(\text{a Queen or a Jack})$.

Solution: $\frac{4+4}{52} = \frac{2}{13}$