What is Probability?

Worksheet

Probability is the ratio of favorable outcomes to total possible outcomes: P(A) = n(A)/n(S). It ranges from 0 (impossible) to 1 (certain).

P(A) = @frac{n(A)}{n(S)}

Questions

1. A bag has 4 red and 6 blue marbles. What is the probability of picking a red marble?
A) 0.4
B) 0.6
C) 4
D) 0.1

2. What is the probability of an impossible event?
A) 1
B) 0.5
C) 0
D) Undefined

3. Rolling a standard die, what is P(number > 4)?
A) 1/6
B) 1/3
C) 1/2
D) 2/3

4. If P(A) = 0.3, what is the probability that A does NOT happen?
A) 0.3
B) 0.7
C) 1.3
D) 0

5. A fair six-sided die is rolled once. What is the probability of rolling a 4?

6. A standard deck of 52 cards is shuffled. What is the probability of drawing a heart?

7. Two fair coins are flipped. What is the probability both land on heads?

8. Define: What is probability?

9. Define: What does P(A) = 0 mean?

10. Define: What does P(A) = 1 mean?

Answer Key

1. A) 0.4 - P(red) = 4/(4+6) = 4/10 = 0.4.
2. C) 0 - An impossible event has probability 0.
3. B) 1/3 - Favorable outcomes {5,6} 2/6 = 1/3.
4. B) 0.7 - P(not A) = 1 P(A) = 1 0.3 = 0.7.
5. Sample space: {1,2,3,4,5,6}, so n(S) = 6 Favorable outcome: {4}, so n(A) = 1 P(A) = n(A)/n(S) = 1/6 0.167
6. Total cards: n(S) = 52 Hearts in the deck: n(A) = 13 P(A) = 13/52 = 1/4 = 0.25
7. Sample space: {HH, HT, TH, TT}, so n(S) = 4 Favorable outcome: {HH}, so n(A) = 1 P(A) = 1/4 = 0.25
8. A number from 0 to 1 measuring how likely an event is, calculated as P(A) = n(A)/n(S).
9. The event is impossible - it can never happen.
10. The event is certain - it will always happen.