Introduction to Probability

Introduction to Probability: Models and Computation

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

For equally likely outcomes, probability is favorable outcomes divided by all outcomes. A fair six-sided number cube has three even outcomes $(2, 4, 6)$, so $P(\text{even}) = \frac{3}{6} = \frac{1}{2}$. Impossible events have probability 0; certain events have probability 1.

Worked example

A bag holds 3 red, 1 blue, and 4 green counters. Draw one counter uniformly at random. Find the probability of red.

1. All counters are equally likely; total outcomes: $3 + 1 + 4 = 8$.
2. Red outcomes: 3, so $P(\text{red}) = \frac{3}{8} = \frac{3}{8}$.
Answer: $\frac{3}{8}$.

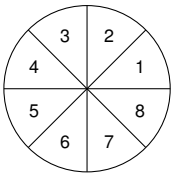
Practice Problems

Show your thinking.

1. A bag holds 5 red, 3 blue, and 2 green counters. Draw one counter uniformly at random. Find the probability of red.

2. A bag holds 4 red, 2 blue, and 2 green counters. Draw one counter uniformly at random. Is red more likely than blue? Give both probabilities.

3. Spin the fair eight-sector spinner once. List the outcomes greater than 5 and find their probability.



4. Roll a fair number cube labeled 1 through 6 once. Find the probability of a number greater than 6, and classify the event.

5. A bag holds 6 red, 3 blue, and 3 green counters. Draw one counter uniformly at random. A student says red has probability $\frac{1}{3}$ because there are three colors. Correct the claim.

6. A bag has 3 red, 4 blue, and 5 green counters. Draw one counter uniformly at random. List the probability of each color and check their sum.

Answer Key

1. $\frac{1}{2}$.
2. Red $\frac{1}{2}$; blue $\frac{1}{4}$; red is more likely.
3. $6, 7, 8$; probability $\frac{3}{8}$.
4. 0; impossible.
5. $\frac{1}{2}$.
6. Red $\frac{1}{4}$; blue $\frac{1}{3}$; green $\frac{5}{12}$. Sum 1.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. All counters are equally likely; total outcomes: $5 + 3 + 2 = 10$.
2. Red outcomes: 5, so $P(\text{red}) = \frac{5}{10} = \frac{1}{2}$.

Problem 2

1. All counters are equally likely; total outcomes: $4 + 2 + 2 = 8$.
2. Red outcomes: 4, so $P(\text{red}) = \frac{4}{8} = \frac{1}{2}$.
3. Blue probability is $\frac{2}{8}$; compare 4 red outcomes with 2 blue outcomes.

Problem 3

1. Favorable sectors are $6, 7, 8$, so there are 3.
2. There are 8 equally likely sectors; probability $= 3 \div 8 = \frac{3}{8}$.

Problem 4

1. None of the 6 faces exceeds 6.
2. Probability is $0 \div 6 = 0$, so the event is impossible.

Problem 5

1. All counters are equally likely; total outcomes: $6 + 3 + 3 = 12$.
2. Red outcomes: 6, so $P(\text{red}) = \frac{6}{12} = \frac{1}{2}$.
3. Colors need not have equal counts; count equally likely individual counters, not just color names.

Problem 6

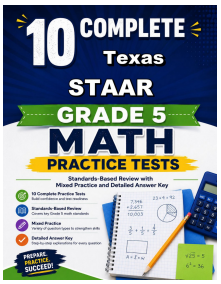
1. The equally likely counters total $3 + 4 + 5 = 12$.
2. Red: $\frac{3}{12} = \frac{1}{4}$. Blue: $\frac{4}{12} = \frac{1}{3}$. Green: $\frac{5}{12}$.
3. One color must occur: $\frac{3}{12} + \frac{4}{12} + \frac{5}{12} = 1$.

TESTINAR

Keep Building Grade 5 Math Skills

Choose the practice book matched to your state assessment and turn worksheet practice into a complete test-prep plan.

All Grade 5 books



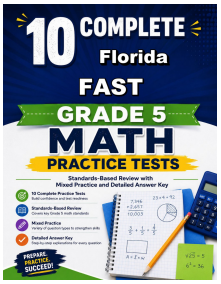
TEXAS STAAR

10 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook



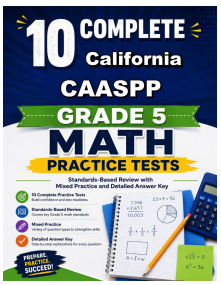
FLORIDA FAST

10 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook



CALIFORNIA CAASPP

10 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook

Need a different state?
Testinar has Grade 5 math practice books for state assessments across the country.

TESTINAR.COM/GRADES/5