Lesson 10-2

Example 1

The table shows the outcomes from an experiment in which a number cube was tossed 200 times.

Number on cube	1	2	3	4	5	6
Number of outcomes	35	32	37	31	36	29

Find each experimental probability.

a. $P(4)$ **b.** $P(1)$

c. $P(\text{odd number})$ **d.** $P(3 \text{ or } 6)$

Solution

Add the number of outcomes to find the total number of tosses. The cube was tossed a total of 200 times.

a. $P(4) = \frac{31}{200}$

b. $P(1) = \frac{35}{200} = \frac{7}{40}$

c. $P(\text{odd number}) = \frac{35 + 37 + 36}{200} = \frac{108}{200} = \frac{27}{50}$

d. $P(3 \text{ or } 6) = \frac{37 + 29}{200} = \frac{66}{200} = \frac{33}{100}$

Example 2

A penny is tossed 60 times. The results are shown in the table. Find the experimental probability of the coin landing heads up.

Outcome	Tally
Heads	𝍸 𝍸 𝍸 𝍸 𝍸 |||
Tails	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 ||

Solution

Count the tally marks. The penny landed heads up 28 times.

$P(\text{heads}) = \frac{28}{60} = \frac{7}{15}$

Example 3

EDUCATION Jeremy is taking a 50-question multiple-choice test in which there are 4 choices for each question. Because he has not studied for the test, he decides to choose his answers at random. In order to pass the test, he must answer at least 50% of the questions correctly. Predict the probability of Jeremy passing the test.

Solution

Each question has 4 possible answers, one of which is correct; either Jeremy answers it correctly or incorrectly. So the test can be simulated by tossing a penny and a dime.

Let tossing two heads represent a correct answer. Any other outcome represents an incorrect answer. Toss both coins at once 50 times and tally the results. The table shows the results of 10 trials, where the first letter represents heads or tails for the penny and the second letter represents heads or tails for the dime.

Trial	Number of HH (correct answers)	Number of HT (incorrect answers)	Number of TH (incorrect answers)	number of TT (incorrect answers)
1	12	14	13	11
2	18	8	15	9
3	11	9	22	8
4	9	18	10	13
5	16	11	13	10
6	26	7	10	7
7	14	17	8	11
8	8	16	13	13
9	13	19	8	10
10	12	10	19	9

A passing score on the test is 50% of 50, or 25 correct answers. In 10 trials, two heads showed on 25 or more tosses just once.

$P(\text{passing test}) = \frac{1}{10}$ $\frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$

$1 \div 10 = 0.1$ or 10%

So the simulation predicts that Jeremy has a 10% chance of passing the test if he answers all the questions at random.

Example 4

INDUSTRY In a tool factory, 500 hammers are selected a random for inspection. Of these, 11 are found to be detective. What is the probability of a hammer being detective?

Solution

$P(\text{defective}) = \frac{11}{500}$ $\qquad \frac{\text{number defective in sample}}{\text{total number in sample}}$

The probability of being defective is $\frac{11}{500}$ or 2.2%.