Simple Probability

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7:26 AM

> **SIMPLE PROBABILITY** is the likelihood that a specific event will occur, represented by a number between 0 and 1.
>
> There are two categories of simple probabilities.
>
> **THEORETICAL PROBABILITY** is calculated probability. If every event is equally likely, it is the ratio of the number of ways the event can occur to the total number of possible outcomes.
>
> $$\text{theoretical probability} = \frac{\text{number of ways to get want you want}}{\text{total number of possible outcomes}}$$
>
> **EXPERIMENTAL PROBABILITY** is the probability based on data collected in experiments.
>
> $$\text{experimental probability} = \frac{\text{number of times the event occurred}}{\text{total number of outcomes}}$$

Example 1

There are three pink pencils, two blue pencils, and one green pencil. If one pencil is picked randomly, what is the theoretical probability it will be blue?

$$\frac{\#\text{ of possible successes}}{\text{total }\#\text{ of possibilities}} = \frac{2}{3+2+1} = \frac{2}{6} = \boxed{\frac{1}{3}}$$

Example 2

Jayson rolled a die twelve times. He noticed that three of his rolls were fours.

a.   What is the theoretical probability of rolling a four?

$$\frac{1}{6}$$

b.   What is the experimental probability of rolling a four?
     There were three fours in twelve rolls. The experimental probability is:
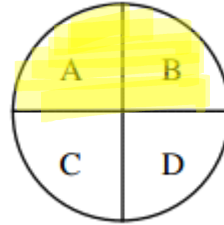
$$\frac{2}{} \qquad 1$$

There were three fours in twelve rolls. The experimental probability is:

$$\frac{3}{12} = \frac{1}{4}$$

Example 3

On the spinner, what is the probability of spinning an A or a B?

$$\frac{2}{4} = \frac{1}{2}$$

A | B

C | D

Example 4

What is the probability of spinning red or white?

$$P(red) = \frac{1}{3}$$

$$P(white) = \frac{1}{4}$$

$$P(red \ or \ white)$$

$$\frac{1^{\times 4}}{3_{\times 4}} + \frac{1^{\times 3}}{4_{\times 3}}$$

$$\frac{4}{12} + \frac{3}{12} = \boxed{\frac{7}{12}}$$

Red | White $\frac{1}{4}$
$\frac{1}{3}$
Blue $\frac{5}{12}$