Theoretical Probability

Probability measures the likelihood that a specific event will occur. Probabilities are expressed as fractions. To find the probability of a specific outcome, use this formula:

Probability of an even $\dfrac{number \text{ of } specific \text{ outcomes}}{Total \text{ number of possible outcomes}}$

Example

If a hat contains nine white buttons, five green buttons, and three black buttons, what is the probability of selecting a green button without looking?

$$\Pr obability = \frac{number \text{ of } specific \text{ outcomes}}{Total \text{ number of possible outcomes}}$$

$$\Pr obability = \frac{number \text{ of } green \text{ buttons}}{Total \text{ number of buttons}}$$

$$\Pr obability = \frac{5}{9+5+3}$$

$$\Pr obability = \frac{5}{17}$$

Therefore, the probability of selecting a green button without looking is $\dfrac{5}{17}$

A box of DVDs contains 13 comedies, four action movies, and 15 thrillers. If Brett selects a DVD from the box without looking, what is the probability he will pick a comedy?

a. $\dfrac{4}{32}$

b. $\dfrac{13}{32}$

c. $\dfrac{15}{32}$

d. $\dfrac{13}{15}$

e. $\dfrac{13}{4}$

Answer

b. $\Pr obability = \dfrac{number \text{ of } specific \text{ outcomes}}{Total \text{ number of possible outcomes}}$. Therefore, you can set up the following fraction:

$$\Pr obability = \frac{number \text{ of comedy DVDs}}{Total \text{ number of DVDs}} = \frac{13}{13+4+15} = \frac{13}{32}$$

Therefore, the probability of selecting a comedy DVD is $\dfrac{13}{32}$