

Probability of Independent and Dependent Events

- Goals**
- Find the probability of independent events.
 - Find the probability of dependent events.

VOCABULARY

Independent Two events such that the occurrence of one has no effect on the occurrence of the other

Dependent events Two events such that the occurrence of one affects the occurrence of the other

Conditional probability The probability that event B will occur depending on whether event A has occurred. This is called the conditional probability of B given A and is written $P(B|A)$.

PROBABILITY OF INDEPENDENT EVENTS

If A and B are independent events, then the probability that both A and B will occur is $P(A \text{ and } B) = \underline{P(A) \cdot P(B)}$.

Example 1 *Probability of Two Independent Events*

A cereal company claims that 3 in every 25 people win a prize. What is the probability that you could not win twice in a row?

Solution

Let event A be not winning the prize on your first try, and event B be not winning the prize on your second try. The two events are independent. So, the probability is:

$$\begin{aligned} P(A \text{ and } B) &= \underline{P(A) \cdot P(B)} \\ &= \underline{\frac{22}{25} \cdot \frac{22}{25}} = \underline{\frac{484}{625}} = \underline{0.7744} \end{aligned}$$