11.7 Events Involving *And*; Conditional Probability

# Objective 1: Find the probability of one event and a second event occurring

Two events are **independent events** if the occurrence of either of them has no effect on the probability of the other.

**PROBABILITIES USING *And* WITH INDEPENDENT EVENTS**

If A and B are independent events, then

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Independent events are not the same as mutually exclusive events. Mutually exclusive events cannot occur at the same time. Independent events occur at the same or different times and have no effect on each other.

**PROBABILITY OF AN EVENT HAPPENING AT LEAST ONCE**

Every event either happens at least once or it never happens.



Two events are **dependent events** if the occurrence of one of them has an effect on the probability of the other.

**PROBABILITIES USING *And* WITH DEPENDENT EVENTS**

If A and B are dependent events, then

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# Objective 2: Compute conditional probability

The probability of event *B* occurring, assuming that an event *A* has already occurred, is called the **conditional probability** of *B*, given *A*, and is denoted by . It is helpful to think of the conditional probability  as the probability that event *B* occurs if the sample space is restricted to the outcomes associated with event *A*.

**FORMULA FOR CONDITIONAL PROBABILITY**

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