

13.4 Find Probabilities of Compound Events

TEKS 8.11.A



- Before**
- Now**
- Why?**

You found the probability of a simple event.
 You will find the probability of a compound event.
 So you can analyze scientific data, as in Ex. 23.

Key Vocabulary

- compound event
- mutually exclusive events
- overlapping events
- independent events
- dependent events

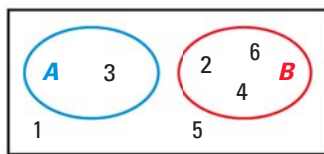
A **compound event** combines two or more events, using the word *and* or the word *or*. To find the probability that either event *A* or event *B* occurs, determine how the events are related. **Mutually exclusive events** have no common outcomes. **Overlapping events** have at least one common outcome.

For instance, suppose you roll a number cube.

Mutually Exclusive Events

Event A: Roll a 3.

Event B: Roll an even number.



Set *A* has **1** number, and set *B* has **3** numbers.

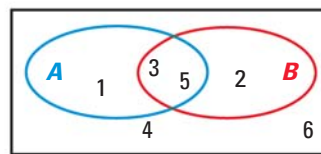
$$P(3 \text{ or even}) = \frac{1}{6} + \frac{3}{6}$$

$$P(A \text{ or } B) = P(A) + P(B)$$

Overlapping Events

Event A: Roll an odd number.

Event B: Roll a prime number.



Set *A* has **3** numbers, and set *B* has **3** numbers. There are **2** numbers in both sets.

$$P(\text{odd or prime}) = \frac{3}{6} + \frac{3}{6} - \frac{2}{6}$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

REVIEW VENN DIAGRAMS

For help with using Venn diagrams, see p. 930.

EXAMPLE 1 Find the probability of *A* or *B*

You roll a number cube. Find the probability that you roll a 2 or an odd number.

Solution

Because 2 is an even number, rolling a 2 and rolling an odd number are mutually exclusive events.

$$\begin{aligned} P(2 \text{ or odd}) &= P(2) + P(\text{odd}) \\ &= \frac{1}{6} + \frac{3}{6} \\ &= \frac{4}{6} \\ &= \frac{2}{3} \end{aligned}$$