

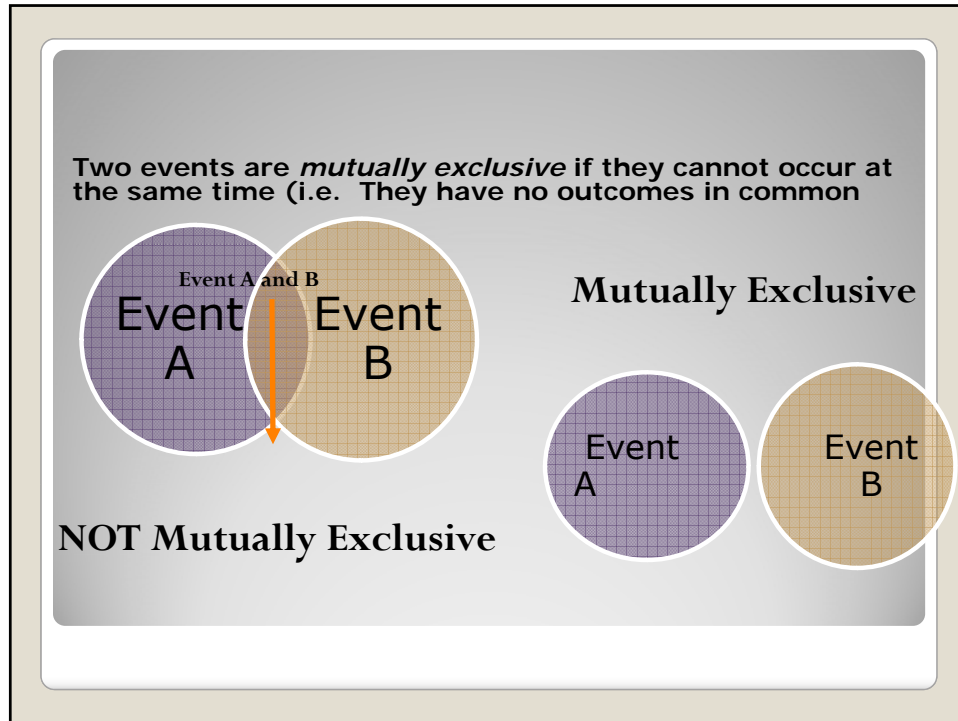
Section 4.3 The Addition Rules for Probability

- Objectives:
 - Determine if two or more simple events are mutually exclusive or not
 - Find the probability of compound events, using the addition rule(s)

- RECALL: **Compound Event:** any event containing two or more simple events
- Compound events may be created by connecting together simple events with connecting words such as OR or AND
- In Section 4.3 we study how to calculate the probability of Event A **OR** Event B occurring.
- In Section 4.4 we study how to calculate the probability of Event A **AND** Event B occurring.

- KEY WORD: **OR**
- Example: If I say I am going to the movie or I am going to the mall, I could
 - Only go to the movie
 - Only go to the mall
 - Go to both the movie and the mall
- In mathematics, OR typically means inclusive, unless otherwise specified.
 - ONE or THE OTHER or BOTH

To determine the probability of a compound event involving OR, we must first determine if the two events are mutually exclusive



Examples—Are the following events Mutually Exclusive?

- At a large political gathering, you select a person at random to determine if the person is a Republican or female
- At a large political gathering, you select a person at random to determine if the person is a Democrat or Independent
- Flip a coin to determine if you get a head or tail
- Roll a die to determine if you get a 4 or 6
- Roll a die to determine if you get 3 or an odd number
- Draw a card from a standard deck to determine if you get a black card or a diamond

<p>Events are Mutually Exclusive</p> $P(A \text{ or } B) = P(A) + P(B)$	<p>Events are NOT Mutually Exclusive</p> $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
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Addition Rules

Example:

		Group			
		O	A	B	AB
Type	Rh +	39	35	8	4
	Rh -	6	5	2	1

If one person is randomly selected, find the probability

- P(person is not group A)
- P(person has type Rh -)
- P(person is group A or type Rh -)
- P(person is group A or group B)
- P(person is not type Rh +)
- P(person is group B or type Rh +)
- P(person is group AB or type Rh +)
- P(person is group A or group O or type Rh+)