Statistics 300: Introduction to Probability and Statistics

Section 4-3

Probability

- Chapter 4
 - -Section 2: Fundamentals
 - -Section 3: Addition Rule
 - -Section 4: Multiplication Rule #1
 - -Section 5: Multiplication Rule #2
 - -Section 6: Simulating Probabilities
 - -Section 7: Counting

Addition Rule

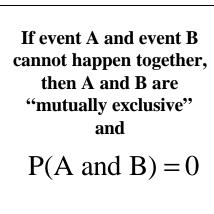
- P(A or B) = ?
 - -One die: P(2 or 5) = ?
 - -One die: $P(\text{odd } \underline{\text{or}} > 4) = ?$

The Addition Rule

P(A or B) = P(A) + P(B) - P(A and B)

		Value of Die #1							
		1	2	3	4	5	6		
8	1	2	3	4	5	6	7		
Value of Die #2	2	3	4	5	6	7	8		
ă	3	4	5	6	7	8	9		
ð	4	5	6	7	8	9	10		
<u>an</u>	5	6	7	8	9	10	11		
>	6	7	8	9	10	11	12		
	_								

Concept of "Mutually Exclusive" outcomes



On one roll of a die:
P(3 and 4) = 0
mutually exclusive
P(4 and "even") > 0
not mutually exclusive

$$P(A \text{ and } B) = 0$$

Using complementary events can make our lives easier!

Probability Rules for Complementary Events

$$P(A) + P(A) = 1$$

$$P(\overline{A}) = 1 - P(A)$$

$$P(A) = 1 - P(\overline{A})$$