

## Lesson 38: Showing Independence

### Showing Independence

Method 1: Two events are independent if and only if  $P(B | A) = P(B)$  and  $P(A | B) = P(A)$

Method 2: Two events are independent if and only if  $P(A \cap B) = P(A) \cdot P(B)$

### Daily Data Collection

Each student will describe if you are a senior and if you currently feel stressed.

	Stressed	Not Stressed	Total
Senior			
Not a Senior			
Total			

Describe if the categories of senior and stressed are independent.

#### Examples:

Events: A = heart for card 1 B = heart for card 2

1. Using a standard deck of playing cards, you draw out one card, replace it, then draw out another card.

Find  $P(A) =$                        $P(B) =$                        $P(A | B) =$

Are events A and B independent?

2. Using a standard deck of playing cards, you draw out one card, then draw out another card without replacement

Find  $P(A) =$                        $P(B) =$                        $P(A | B) =$

Are events A and B independent?

## Review Example

Zack has applied to both Princeton and Stanford. He thinks the probability that that Princeton will admit him is 0.4, the probability that Stanford will admit him is 0.5, and the probability that both will admit him is 0.2.

(a) Make a Venn diagram marked with the given probabilities.

(b) What is the probability that neither university admits Zack?

(c) What is the probability that he gets into Stanford but not Princeton?

**HW 38 - Section 5-3: 65, 66, 69, 70, 73**

**Study for Quiz 11 over lessons 35, 36, 37, 38 reviews 3, 27, 28**