Tuesday
11.12.13

CCGPS Geometry

UNIT QUESTION: What connection does conditional probability have to independence?

Standard: MCC9-12.S.CP.1-7

Today's Question:
What is the difference between the intersection and the union of 2 events?

Standard: MCC9-12.S.CP.1, 7

Compound Probability

A ***compound event*** combines two or more events, using the word ***and*** or the word ***or***.

AND

Means you

MULTIPLY

OR

Means

you ADD

Mutually Exclusive vs. Overlapping

If two or more events cannot occur at the same time they are termed ***mutually exclusive***.

They have **no** common outcomes.

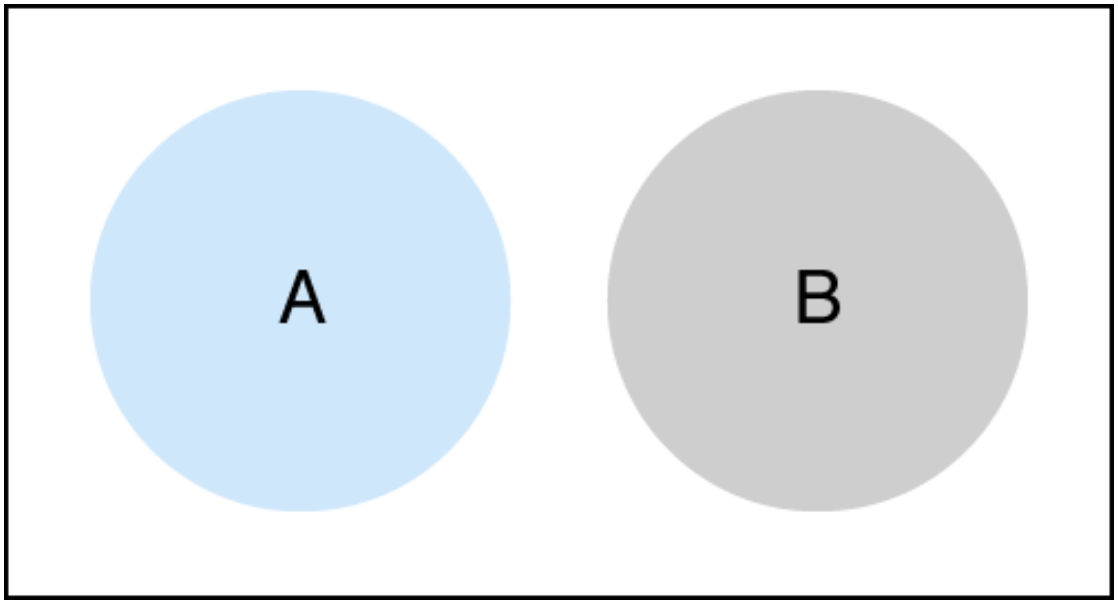
Overlapping events have **at least one common outcome.**

Mutually Exclusive Events

For mutually exclusive events, the probability that one or the other of several events will occur is found by summing the individual probabilities of the events:

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

A *Venn diagram* is used to show mutually exclusive events.



Mutually Exclusive Events

Example 1:

Find the probability that a girl's favorite department store is Macy's or Nordstrom. **0.45**

Find the probability that a girl's favorite store is not JC Penny's. **0.90**

Macy's	**0.25**
Saks	**0.20**
Nordstrom	**0.20**
JC Pennys	**0.10**
Bloomingdale's	**0.25**

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

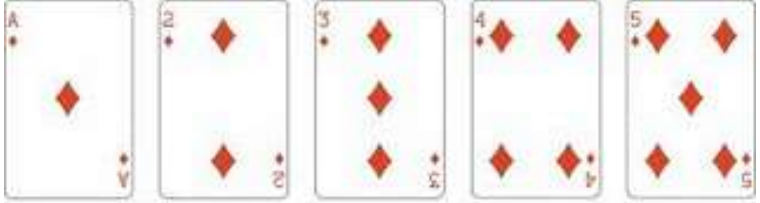
Mutually Exclusive Events

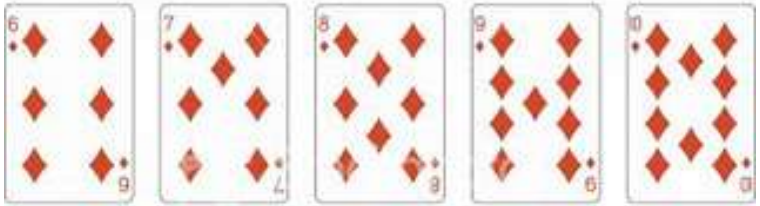
Example 2:

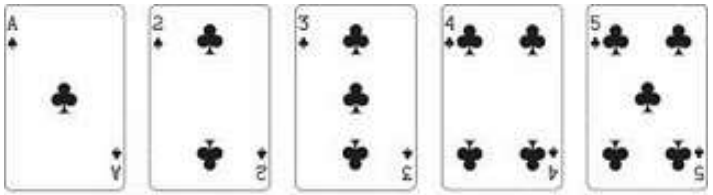
When rolling two dice, what is probability that your sum will be 4 or 5?

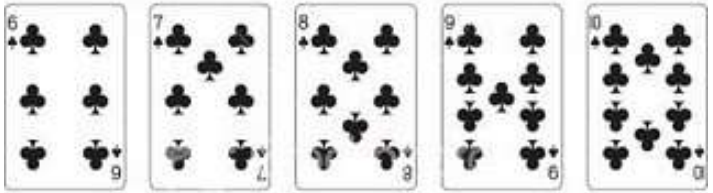
7/36

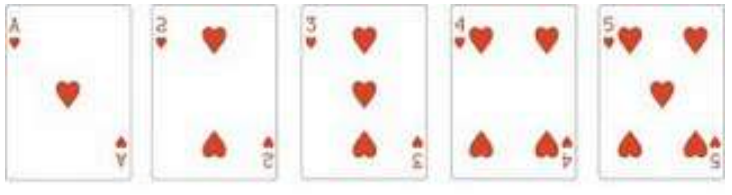

Clubs
Hearts
4 Suits
Diamonds
Spades

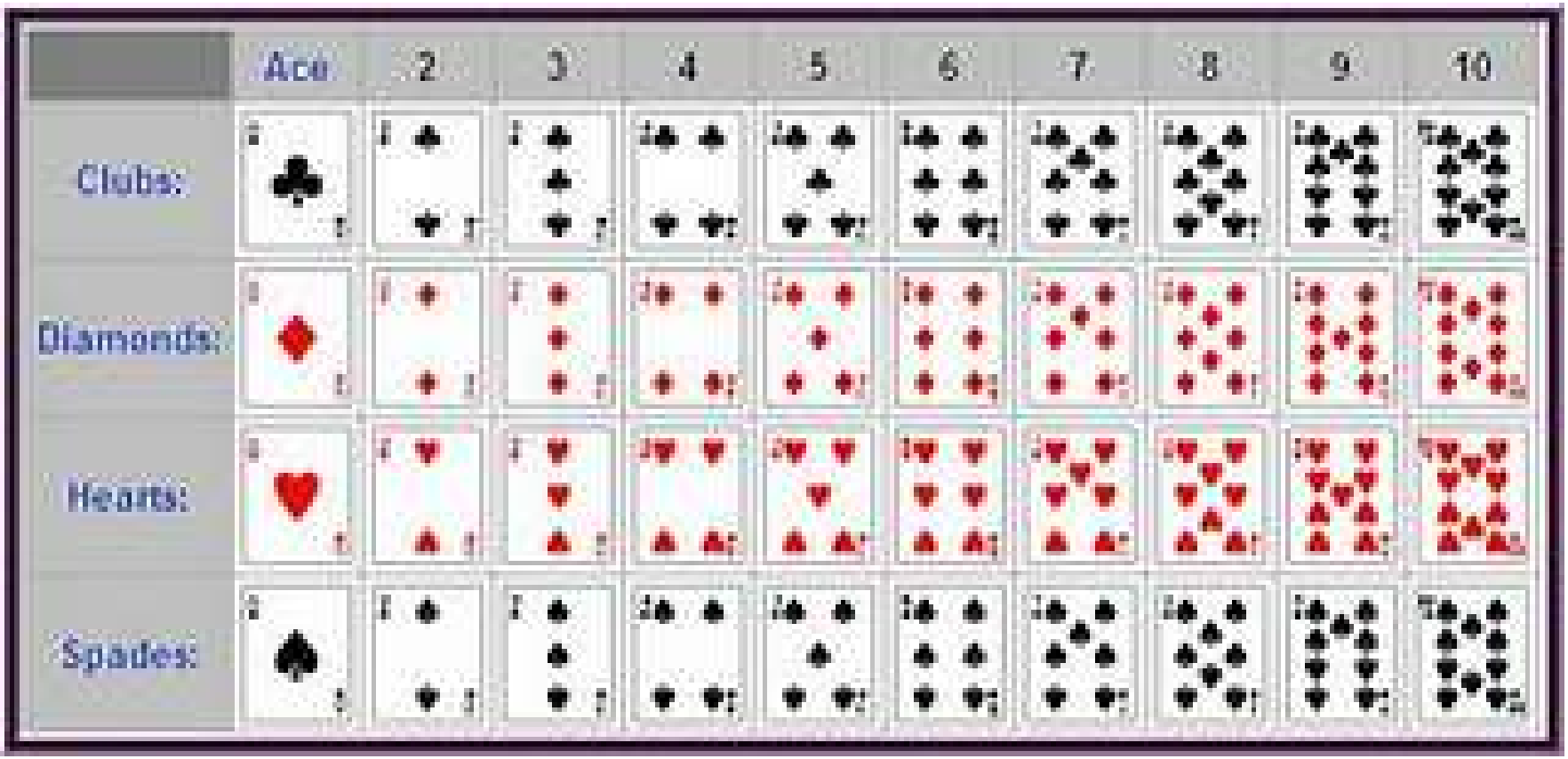











Ace
2
3
4
5
6
7
8
9
10
Clubs:
Diamonds:
Hearts:
Spades:

Mutually Exclusive Events

Example 3:

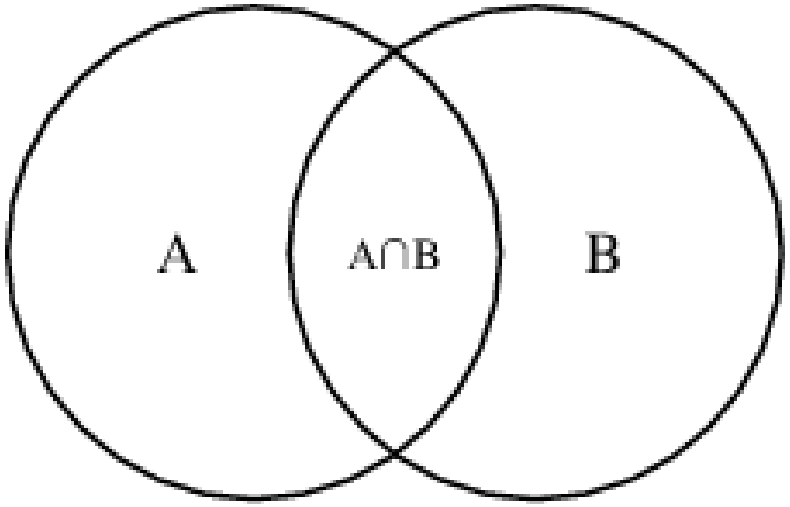
What is the probability of picking a queen or an ace from a deck of cards

2/13

Overlapping Events

Probability that non-mutually exclusive events A and B or both will occur expressed as:

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



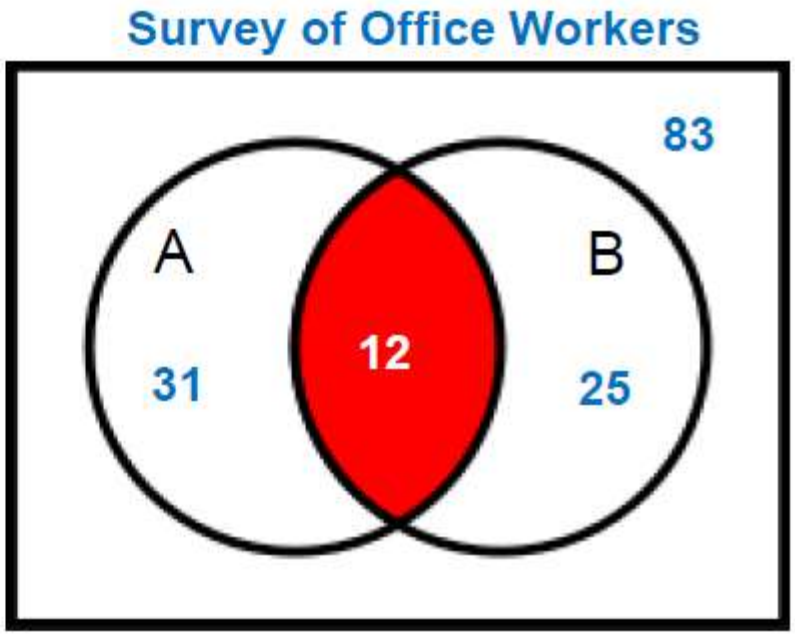
Intersection of 2 Events

Denoted by the symbol: A ∩ B

Is the event containing all elements that are COMMON to both A and B

This is an AND probability!

Example:
If A = drink coffee and B = drink soda, find the probability that a person will drink both.

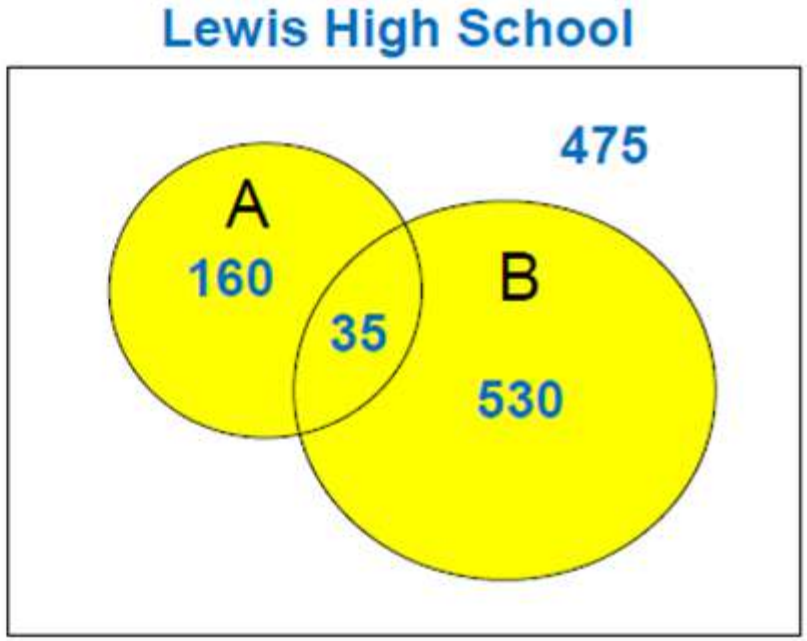


Overlapping Events

Example 1:

Find the P(A B)

A = band members
B = club members



29/48

Overlapping Events

Example 2:

Find the probability of picking a king or a club in a deck of cards.

4/13

Overlapping Events

Example 3:

Find the probability of picking a female or a person from Florida out of the committee members.

	Fem	Male
FL	8	4
AL	6	3
GA	7	3

$$\frac{21}{31} + \frac{12}{31} - \frac{8}{31} = \frac{25}{31}$$

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Overlapping Events

Example 4:

When rolling 2 dice, what is the probability of getting an even sum or a number greater than 10?

$$\frac{18}{36} + \frac{3}{36} - \frac{1}{36} = \frac{20}{36} = \frac{5}{9}$$

Complementary Events

The complement of an event is the set of outcomes in the same sample space that are not included in the outcomes of the event.

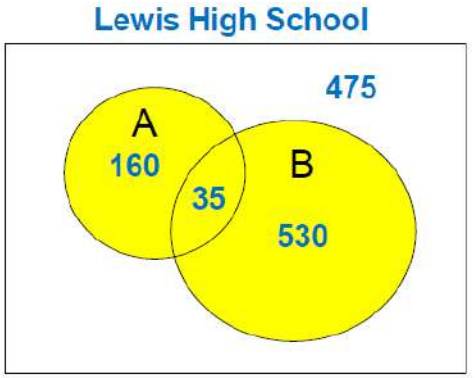
The complement is denoted with the word “not,” or with the ' or $^{-}$ symbol.

What is the probability not being in the band or a club?

$P(\overline{A \text{ Y } B}) =$ **1 - 29/48**

=19/48

A = band members
B = club members



Complementary Events

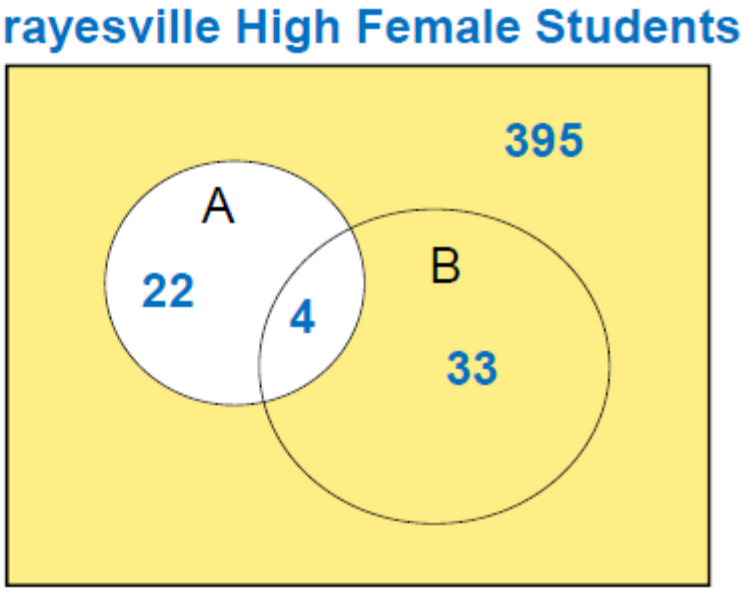
What is the probability that a female does not play volleyball?

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

1 - 26/454

= 214/227

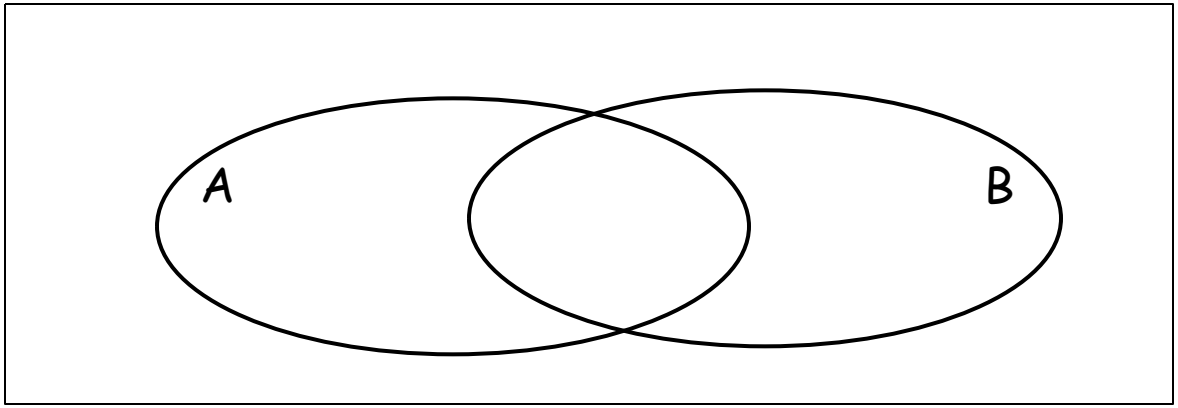
Example:
If A = plays volleyball and B = plays softball, find the probability that a person will not play volleyball.



Class Example

A = people in a Science Class

B = people in an English Class



$P(A \cup B) =$

$P(A \cap B) =$

$P(\overline{A}) =$

$P(\overline{A \cup B}) =$

Task:
How odd?

Homework Practice Worksheet