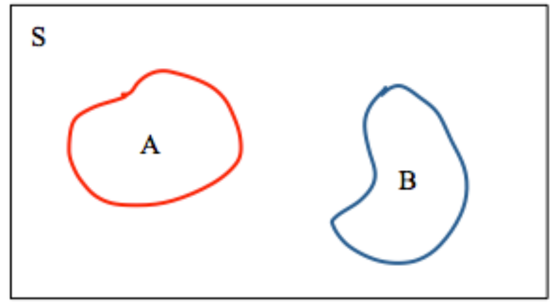
Lesson 36: Addition, Multiplication, and Complement

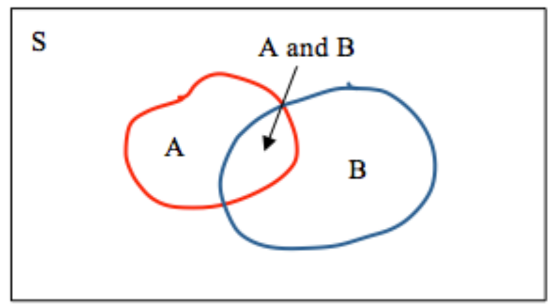
Addition rule two ways.



<u>Addition Rule for Mutually Exclusive Events</u>
If two events have no outcomes in common, the probability that one or the other occurs is the sum of their individual probabilities.

In symbols: If A and B are "mutually exclusive"

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



<u>General Addition Rule for Two Events</u>
This rule works for all addition questions. If the events are mutually exclusive, then P(A and B) = 0. If the events are not mutually exclusive, then P(A and B) is counted in P(A) and P(B). Therefore it is counted twice and needs to be subtracted once (see the picture).

For any two events A and B,
P(A or B) = P(A) + P(B) – P(A and B) **symbols:** $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Example:
In a room full of people, the probability of selecting a teenager at random (event A) is 4/30 and the probability of selecting a boy (event B) is 13/30. The probability of selecting a male teen is (1/30).

P(A or B) =

Now model this with a table:

	Teen	Not Teen	Total
Boys			
Girls			
Total			

Example: Consider a standard deck of 52 cards

Event A = Face Card   Event B = Heart   Find P(A U B)

Model this with a Venn Diagram:

Daily Data Collection

Each student will describe their gender and whether they currently have a significant other.

	SO – Yes	SO - No	Total
Boys			
Girls			
Total			

Find the probability of a randomly selected student being a Male or Has a Significant Other.

Show how the above probability is found using the formula for non-mutually exclusive events.

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