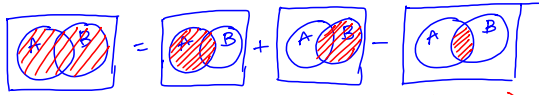6. General Addition Rule:

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

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Intersection: $A \cap B$ "and"

when 2 events are both happening

ex: Event A = Ace
Event B = heart
$A \cap B$ = Ace of hearts

Union: $A \cup B$ "or"

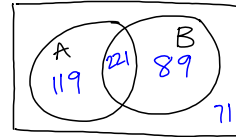either A or B or both

ex: $A \cup B$ = All aces and all hearts

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ex:
Event A = home owner
Event B = H.S. grad

$$P(A \cup B) = \frac{500 - 71}{500}$$

$$= \frac{429}{500}$$

A 119 221 B 89

71

$$= \frac{119 + 221 + 89}{500}$$

$$= \frac{310 + 340 - 221}{500}$$

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ex: A customer walks into einsteins.

P(buy a bagel) = 0.85
P(buy a drink) = 0.2
P(buy a bagel & drink) = 0.15

Bagel .7 .15 Drink .05 .1

$$P(\text{bagel or drink}) = 0.85 + 0.2 - 0.15$$
$$= \boxed{0.9}$$