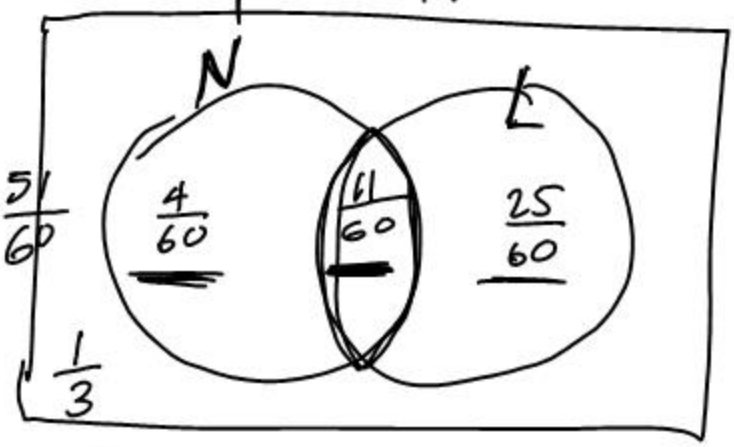
BC #6.

$\frac{1}{4} + \frac{3}{8} = \frac{5}{20} + \frac{12}{20} = \frac{17}{20} = \frac{51}{60}$

$\frac{2}{3} = \frac{40}{60}$

$\frac{3}{5} = \frac{36}{60}$

probabilities



N

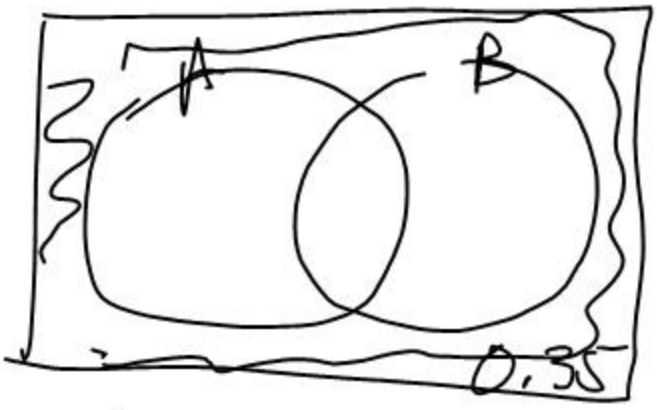
$\frac{1}{4} - \frac{11}{60} = \frac{15}{60} - \frac{11}{60} = \frac{4}{60}$

$\frac{3}{5} - \frac{11}{60} = \frac{36}{60} - \frac{11}{60} = \frac{25}{60}$

3G #2. $P(A' \cap B') = 0.35$

$P(A) = 0.25$

$P(B) = 0.6$



$P(A \cup B) = 0.65$ (or)

The addition rule

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

$= 0.25 + 0.6 - 0.65 = 0.2$

(b) $P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.2}{0.6} = \frac{1}{3}$

(c) $P(B' \mid A') = \dfrac{P(B' \cap A')}{P(A')} = \dfrac{0.35}{1 - P(A)}$

$= \dfrac{0,35}{0.75} = \dfrac{7}{15}$

3G #3 S = skateboard
R = roller blades

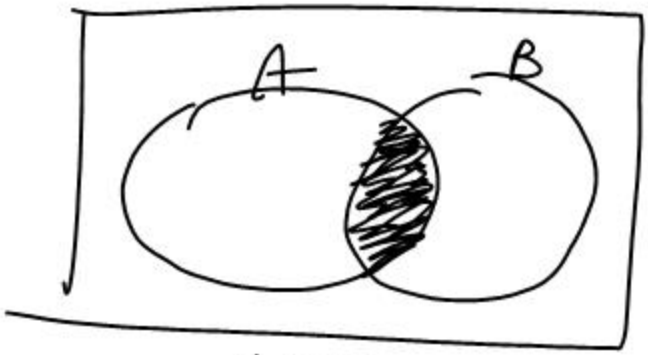
$P(S') = 0.48$

$P(S \cap R) = 0.39$

$P(R \mid S) = \dfrac{P(S \cap R)}{P(S)} = \dfrac{0.39}{0.48} = \dfrac{13}{16}$

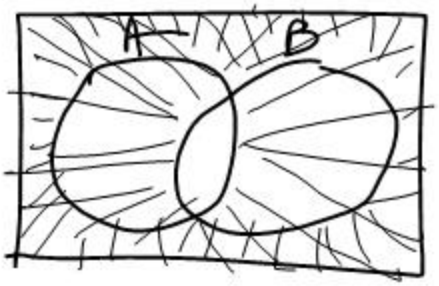
Quiz Venn diagram, addition rule, complementary events, conditional prob.

$A \cup B$ or $A' \cap B'$



$A \cap B$ intersection

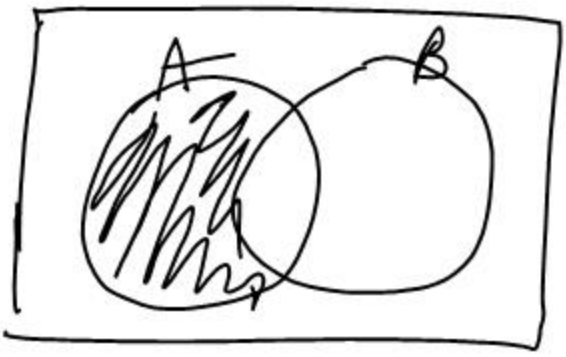
A (and)



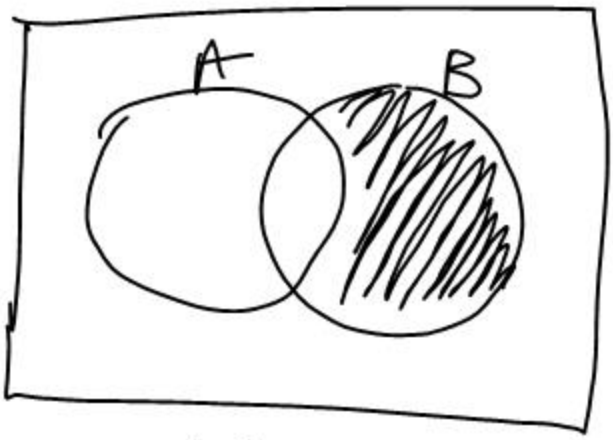
$A' \cup B'$

or

union



$A \cap B'$



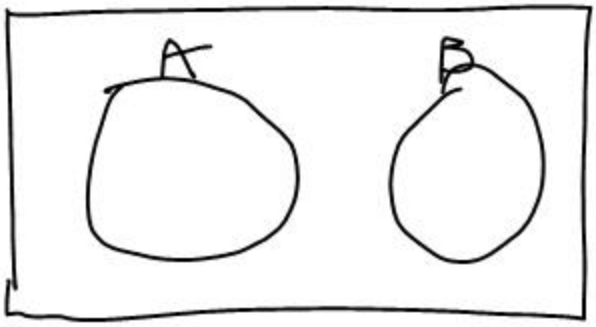
$A' \cap B$

Mutually Exclusive Events

These events cannot happen at the same time.

Ex. Toss a coin. A = get heads B = get tails

A and B are mutually exclusive.



A and B are mutually exclusive: $P(A \cap B) = 0$ *

Addition Rule for M.E. events:

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

Ex. A box contains marbles of various colors. $\frac{1}{4}$ of them are red. $\frac{1}{5}$ of them are blue.

Find $P(R \cup B)'$.

$$P(R \cup B) = P(R) + P(B)$$

$$= \frac{1}{4} + \frac{1}{5}$$

$$= \frac{9}{20}$$

$$P(R \cup B)' = 1 - \frac{9}{20} = \frac{11}{20}$$

Independent Events

If the occurrence one event does not change the probability of another event, then they are <u>independent events</u>.

Ex. Draw 2 cards.

A = 1st card is red.

B = 2nd card is red.

Are A and B independent? <u>NO</u>

Suppose A happens: $P(B|A) = \frac{25}{51}$

Suppose A doesn't happen: $P(B|A') = \frac{26}{51}$

Ex. Toss 2 coins.

A = 1st coin is heads

B = 2nd coin is heads.

Are A and B independent? <u>yes</u>

$$P(B|A) = 0.5$$

$$P(B|A') = 0.5$$

HW

3C #5

3D #2-4

Review for quiz