

MORE PROBABILITY

Combinations

All must be true

- * No replacement
- * No order
- * Dependent events -
the 2nd event depends
on the result of the first
events

Individual Probabilities

If Any are true:

- * Replacement
- * Order
- * Independent events -
the 2nd event is not
influenced by the
outcome of the 1st event
(chances do not change)
Rolling dice
Flipping coins



Draw 3 + keep them.

$$P(2 \text{ 100's} + 1 \text{ 50}) = \frac{{}_2C_2 \cdot {}_1C_1}{{}_{14}C_3} = \frac{1}{91}$$

Combinations

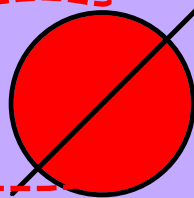
- *No replacement
- *No order
- *Dependent

$$\text{Prob}(\text{\$20, then \$100, then \$20}) = \frac{8}{14} \cdot \frac{2}{13} \cdot \frac{7}{12} = \frac{2}{39}$$

Order = No Comb.

What NOT to do:

$$\frac{1}{8} \cdot \frac{1}{2} \cdot \frac{1}{7}$$



Pick 1 bill. Draw, put back, draw.

Prob(\$20, put back, \$50)

$$\frac{8}{14} \cdot \frac{4}{14} = \frac{4}{7} \cdot \frac{2}{7} = \boxed{\frac{8}{49}}$$

Combinations

- *No replacement
- *No order
- *Dependent

odds

~~$$\frac{8}{6} \cdot \frac{4}{10}$$~~

Find prob. first!

Mutually Inclusive/Exclusive Events

Deck of cards - Draw 1 card

OR = ADD

Prob(ace or black card)

$$\frac{4}{52} + \frac{26}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$$

Only with OR problems

Mutually Inclusive Events - share common items

Mutually Exclusive Events - share NO common items.
Prob(ace or face card)

Draw 2 cards. Prob(²face cards OR ²red)

Common items?

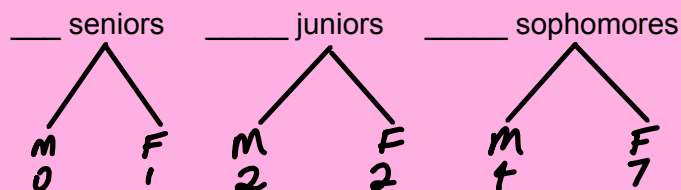
$$\frac{12C_2 + 26C_2 - 6C_2}{52C_2}$$

common items

Combinations
*No replacement
*No order
*Dependent

Prob = $\frac{188}{663}$ $\frac{\text{Suc}}{\text{total}}$

ODDS = $\frac{188}{475}$ $\frac{\text{Suc}}{\text{fail}}$



Select 2 people to earn extra homework coupon.

Odds (2 juniors or 2 females)

$$\frac{4C_2 + 10C_2 - 2C_2}{16C_2} = \frac{5}{12}$$

Odds $\frac{5}{7}$

Pick 5 students.

Prob (at least 3 males)

$$\frac{3M+2F \quad \text{OR} \quad 4M+1F \quad \text{OR} \quad 5M}{6C_3 \cdot 10C_2 + 6C_4 \cdot 10C_1 + 6C_5}$$

$$16C_5$$

$$= \frac{22}{91}$$

AT LEAST
AT MOST
No More Than

Write out all possibilities using OR.

