Probability

$P = \frac{\text{what I want}}{\text{Total}}$

AND - x - or - +

Total Probability - 1

$P + \bar{P} = 1$

selecting not-selecting

1.) Suresh keeps all his socks in a single drawer. He has a 24 pairs W, 18 pairs Grey He picks 3 randomly. Possibility of matching pair

The thing is total socks = 24+18
42W + 36 Gray

If he picks White we will be left with G, even if he picks Green he will complete the task, even if it is white he does
So Probability = 1 //

2.) what will be the possibility of drawing a Jack or a Spade from a well shuffled deck of cards

J or Spade J + S

Since J is also in Spade we need to remove that

$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{12}{52} = \frac{4}{13}$

3) A box has 6 black, 4 red, 2 white and 3 blue shirts. when 2 shirts are picked randomly, what is the probability both are white or both are blue

Choosing 2 shirts we will have one in our hand then chose next so count will reduce

we need both white or blue
W + blue

Total shirts = 15

$$\frac{2}{15} \times \frac{1}{15} + \frac{3}{15} \times \frac{2}{15} = \frac{1}{105} + \frac{3}{105} = \frac{4}{105}$$

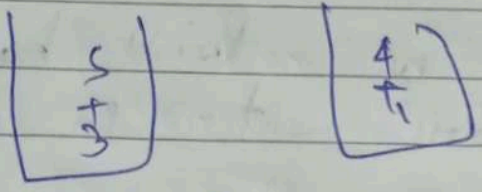
4) A pot has 2 white, 6 black, 4 gray and 8 green balls. If one ball is picked randomly from the pot, what is the Probability of being black or gray

Total ball 2+6+4+8 = 20

B(or) + G

$$\frac{8}{20} + \frac{6}{20} = \frac{14}{20} = \frac{7}{10}$$

5.) There are 2 pots. one pot has 5 red and 3 green. other has 4 red and 2 green marbles. what is the possibility of drawing red marble?



see they have given 2 Pots so we have to consider the probability of that too

$$\frac{1}{2} \times \frac{5}{8} + \frac{1}{2} \times \frac{4}{6} = \frac{31}{48}$$

6.) In a set of 30 game cards. 17 are white 9 are green. 4 white and 5 green are marked important. If a card is chosen randomly, probability of choosing a green or Important Card

G = 13 also Imp. Card has Green double counting

$$\frac{13}{30} + \frac{9}{30} - \frac{5}{30}$$

$$\frac{17}{3C_2}$$

7.) A box has 6 black, 4 red, 2 white and 3 Blue shirts. Find the probability of drawing 2 black

Same rule If I had to pick 2 I will pick 1 and Then 2

$$\frac{6}{15} \times \frac{5}{14} = \frac{30}{210} = \frac{1}{7}$$

8.) A box has 6 black, 4 red, 2 white and 3 blue shirts. what is the probability that 2 red shirts and 1 blue shirt get chosen during a random selection of 3 shirts

We need 2R & 1 Blue randomly possible Probabilities

$$R \times R \times B + R \times B \times R + B \times R \times R$$

$$\frac{4}{15} \times \frac{3}{14} \times \frac{3}{13} \quad \frac{4}{15} \times \frac{3}{14} \times \frac{3}{13} + \frac{3}{15} \times \frac{4}{14} \times \frac{3}{13}$$

$$\frac{36 \times 3}{15 \times 14 \times 13} = \frac{18}{455}$$

9.) A box has 6 black, 4 red, 2 white and 3 blue shirts. what is probability at least 1 red shirt in 4 shirts that are randomly picked

4 - 1 or 2 or 3 or 4

It says atleast one Red So we can have 1r or 2r ... 4r

Remember 1 = Probability of red + Probability of not red

remove all the red shirts

$$\frac{11}{15} \times \frac{10}{14} \times \frac{9}{13} \times \frac{8}{12} = \frac{22}{91}$$

$$1 - \frac{22}{91} = \frac{69}{91} \text{ - Probability of red}$$

10.) on rolling a dice 2 times, the sum of 2 no: is 8. what is the Probability that first thrown dice yields 4

2 dice - 6×6 = 36

which gives Sum

(2,6) (3,5) (4,4) (5,3) (6,2) = $\frac{1}{36}$

1

1 only

11.) A box has 5 black and 3 green. One shirt is picked and put in another box. The second box has 3 black and 5 green. Now a shirt from second box is. what is the probability of black shirt

we have 2 case of 2 scenari

1.) picking one black here and adding the pick

2.) picking green adding there and then picking

$$\left[\frac{5B}{3G}\right] + \left[\frac{3B}{5G}\right]$$

$$\frac{5B}{8} * \frac{4B}{9} = \frac{20}{72} \quad \text{--- (1)}$$

$$\frac{3}{8} * \frac{3}{9} = \frac{9}{72} \quad \text{--- (2)} \qquad \frac{20}{72} + \frac{9}{72} = \frac{29}{72}$$

12.) what is the possibility of having 53 thursday in a non-leap

There will be 52 weeks The rest could be any day out of 7 so

$$\frac{1}{7}$$

13) In a drawer there are 4 white socks 3 Blue Socks, 5 grey sock. Two socks are picked randomly both are same color?

2W or 2B or 2G

$$\frac{4}{12}\times\frac{3}{11}+\frac{3}{12}\times\frac{2}{11}+\frac{5}{12}\times\frac{4}{11}$$

$$\frac{1}{11}+\frac{1}{22}+\frac{5}{33}=\frac{19}{66}$$

14) what is probability of picking 2 clubs from a well shuffled pack of 52 cards

Probability of picking 13

$$\frac{13}{52}\times\frac{12}{51}=\frac{1}{17}$$

15) what are the chances that no 2 boys are sitting together for a photograph there are 5 girls and 2 boys.

use Permutation & combination

2 boys - 2! - 1! group

Total 7 soul can have 7! ways

5 girls + 1 grp - 6 grp

$n = n + \bar{n}$

$7! = 6! \times 1! + \bar{n}$

$7! - 6! \times 2!$ $\quad 6! \times 5$

//

16) when a coin is tossed, what are the chances of getting atleast one head

(H,H) (H,T) (TH) (TT)

atleast T

$P = \frac{w}{T} = \frac{3}{4}$