


Heads ✓
Tails ✓

Common Types

- 2 possibilities
- 2) Cards → 52 cards
52 possibilities
- 13 spade - B
 - 13 heart - R
 - 13 club - B
 - 13 diamond - R
- 2-10, J, K, Q, A
- 3) Dice →  6 faces → 1, 2, 3, 4, 5, 6
6 possibilities
- 4) Socks, balls, marbles, shirts, etc. → Case by Case

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(1) Suresh keeps all his socks in a single drawer. He has 24 pairs of white socks and 18 pairs of grey socks. Suresh picks 3 socks randomly. Find the possibility of Suresh choosing a matching pair?

24p W → 48 W
18p G → 36 G

W G W/G
W/G

ALWAYS

1

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(2) What will be the possibility of drawing a jack or a spade from a well shuffled standard deck of 52 playing cards?

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

One \rightarrow Jack ✓
 (OR) \rightarrow (+)
 One \rightarrow Spade ✓
 double counting

$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \frac{4}{13}$

CARDS
 52 \rightarrow Total
 13 C \rightarrow J
 13 S \rightarrow J
 13 H \rightarrow J
 13 D \rightarrow J

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

2 shirts \rightarrow 1st shirt (8) 2nd shirt (x)
 2W OR 2Blue

1W ✓
 6
 1W
 $\frac{2}{15} \times \frac{1}{14} = \frac{2}{210}$

(+)
 1B
 6
 1B
 $\frac{3}{15} \times \frac{2}{14} = \frac{2}{105}$

(+)
 $\frac{2}{210} + \frac{2}{105} = \frac{4}{105}$

P = $\frac{W}{T}$
 6 black
 4R
 2W
 3Blue
 Total \rightarrow 15 shirts

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(5) A box has 2 white, 6 black, 4 grey and 8 green balls. If one ball is picked and only from the pot, what is the probability of drawing black or green?

$$1 \rightarrow B \text{ or Green} \\ \downarrow \quad \downarrow \\ \frac{6}{20} + \frac{8}{20} = \frac{14}{20} = \frac{7}{10}$$

$P = \frac{N}{T}$

2W
6B
4Grey
8Green

Total \rightarrow 20 Balls

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(5) There are 2 pots. One pot has 5 red and 3 green marbles. Other has 4 red and 2 green marbles. What is the probability of drawing a red marble?

EASY X

5R
3G

1

4R
2G

2

Choosing Pot

1st OR 2nd

1 or 2 Considered

$$\frac{1}{2} \times \frac{5}{8} + \frac{1}{2} \times \frac{4}{6} = \frac{5}{16} + \frac{4}{12} \rightarrow \frac{15+16}{48} = \frac{31}{48}$$

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(6) In a set of 30 game cards, 17 are white and rest are green. 4 white and 5 green are marked IMPORTANT. If a card is chosen randomly from this set, what is the possibility of choosing a green card or an 'IMPORTANT' card?

1 → Green OR IMP card

$$\frac{13}{30} + \frac{5}{30} = \frac{18}{30} = \frac{3}{5}$$

Handwritten calculation: $\frac{17}{30}$ (Total Green) and $\frac{9}{30}$ (Total Important) leading to $\frac{17}{30}$ (Total Green or Important).

Handwritten notes: $P = \frac{18}{30}$, CARDS 30, Total 30, $G = 30 - 17 = 13$.

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(7) A box has 6 black, 4 red, 2 white and 3 blue shirts. Find the probability of drawing 2 black shirts if they are picked randomly?

2 → 1st B & 2nd B

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

Handwritten notes: 6B, 4R, 2W, 3B, 15 shirts.

(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 from the box?

3 → 1st & 2nd & 3rd

2R & 1B
1st B × R × R OR 2nd R × B × R OR 3rd R × R × B

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

$\frac{36}{15 \times 14 \times 13} + \frac{36}{15 \times 14 \times 13} + \frac{36}{15 \times 14 \times 13}$

$= 3 \left(\frac{36}{15 \times 14 \times 13} \right) = 3 \left(\frac{6}{5 \times 7 \times 13} \right) = \frac{18}{455}$

6 Black
4 Red
2 W
3 Blue
5 shirts
Total

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

4 → 1st or 2nd or 3rd or 4th Diff

X Red

15 → 4 Red
6 + 2 + 3 = 11 Shirts

NP = 1st × 2nd × 3rd × 4th

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

$P = 1 - \frac{22}{91} = \frac{69}{91}$

$P + NP = 1$

$P = \frac{N}{T}$

6 B
4 R
2 W
3 Blue
15 shirts

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(10) On rolling a dice 2 times, the sum of 2 numbers that appear on the uppermost face is 8. What is the probability that the first throw of dice yields 4?

Handwritten solution for Question 10:

2 → 1st & 2nd
 6p & 6p = $6 \times 6 = 36$ possibilities
 Total

1, 2, 3, 4, 5, 6 (DICE)

$P = \frac{W}{T} = \frac{1}{36}$

Outcomes for sum = 8: (2, 6), (3, 5), (4, 4), (5, 3), (6, 2)
 Only (4, 4) is marked with a checkmark and leads to the answer 1.

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(11) A box has 5 black and 3 green shirts. One shirt is picked randomly and put in another box. The second box has 3 black and 5 green shirts. Now a shirt is picked from second box. What is the probability of it being a black shirt?

Handwritten solution for Question 11:

✓ B → $\frac{5}{8}$ & 1B (2nd) $\frac{4}{9} = \frac{5}{8} \times \frac{4}{9} = \frac{20}{72}$

OR

✓ G → $\frac{3}{8}$ & 1B (2nd) $\frac{3}{9}$

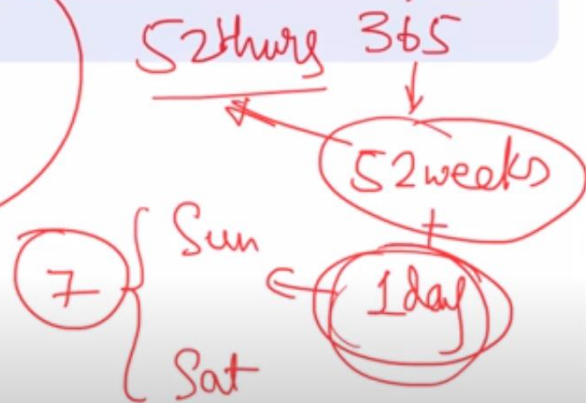
Final calculation: $\frac{20}{72} + \frac{9}{72} = \frac{29}{72}$

Diagram showing the flow of probability calculations and the final result.

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(12) What is the possibility of having 53 Thursdays in a non-leap year? Two socks are picked randomly. What is the possibility that both the socks are of same color?

$$P = \frac{W}{T} = \frac{1}{7}$$

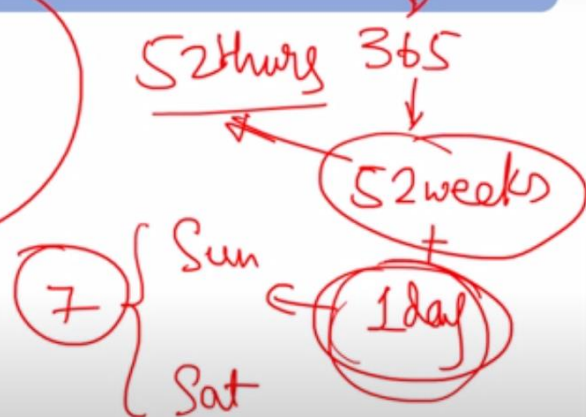


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(12) What is the possibility of having 53 Thursdays in a non-leap year?

$$P = \frac{W}{T} = \frac{1}{7}$$



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(13) In a drawer there are 4 white socks, 3 blue socks and 5 grey socks. Two socks are picked randomly. What is the possibility that both the socks are of same color?

→ EASY

$$2 \rightarrow 2W \quad \text{OR} \quad 2B \quad \text{OR} \quad 2\text{Grey}$$

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

$$\frac{1}{11} + \frac{1}{22} + \frac{5}{33} = \frac{6+3+10}{66} = \frac{19}{66}$$

Total = 12
 $P = \frac{W}{T}$

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(14) What is probability of drawing two clubs from a well shuffled pack of 52 cards?

→ CARDS

$$2 \rightarrow \text{club \& Club}$$

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

→ 52
 $P = \frac{W}{T}$
 13 club

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EASY

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← count

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