
PROBABILITY

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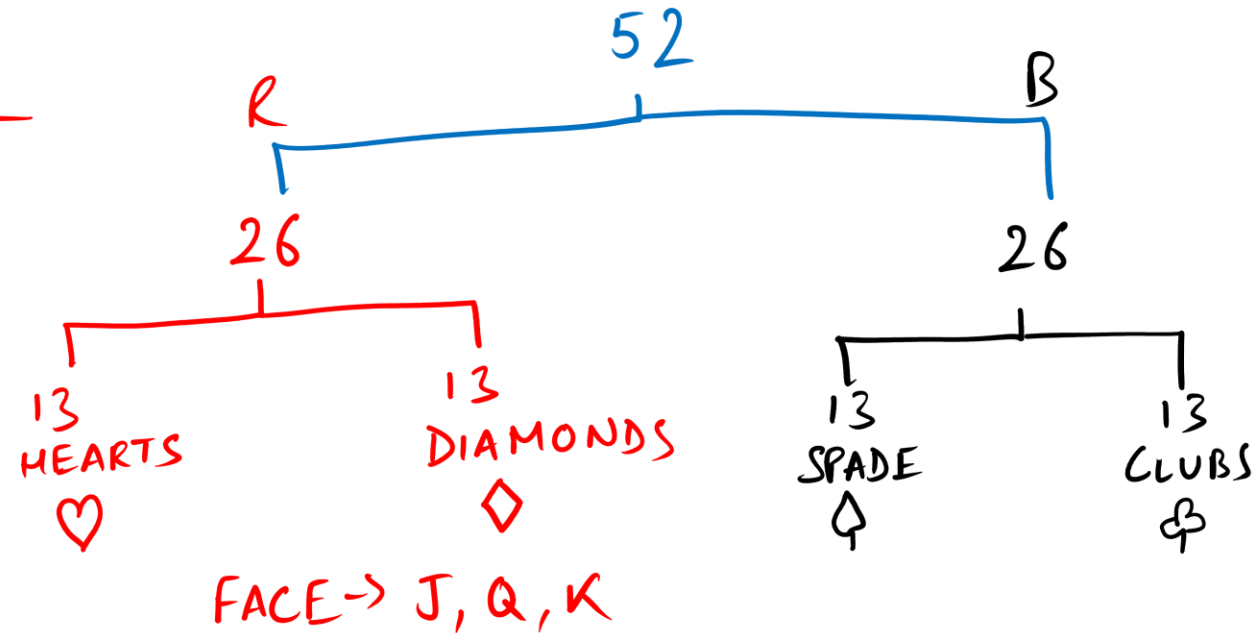


www.youtube.com/TheAptitudeGuy

CONCEPT

$$P = \frac{\text{Favourable}}{\text{Total}}$$

CARDS
COINS



I. A card is drawn from a well-shuffled pack of cards. What is the probability of getting a spade?

Ans: _____

$$P = P(s) = \frac{13}{52} = \underline{\underline{\frac{1}{4}}}$$

$$P = \frac{{}^{13}C_1}{{}^{52}C_1} = \frac{13}{52} = \underline{\underline{\frac{1}{4}}}$$

2. A card is drawn from a well-shuffled pack of cards. What is the probability of getting a spade or a diamond?

Ans: _____

$$P = P(S) \text{ or } P(D) \\ = \frac{13}{52} + \frac{13}{52} = \frac{1}{4} + \frac{1}{4} = \underline{\underline{\frac{1}{2}}}$$

$$P = \frac{{}^{13}C_1 + {}^{13}C_1}{{}^{52}C_1} = \frac{13+13}{52} = \frac{26}{52} = \underline{\underline{\frac{1}{2}}}$$

$$\frac{{}^{26}C_1}{{}^{52}C_1}$$

3. Two cards are drawn from a well-shuffled pack of cards. What is the probability that the first is a spade and the second is a diamond?

Ans: _____

$$P = P(S, D) = \frac{13}{52} \times \frac{13}{51} = \frac{1}{4} \times \frac{13}{51} = \frac{13}{204}$$

$$P = \frac{{}^{13}C_1 \times {}^{13}C_1}{{}^{52}P_2} = \frac{13 \times 13}{52 \times 51} = \frac{13}{204}$$

4. Two cards are drawn from a well-shuffled pack of cards. What is the probability of getting a spade and a diamond?

Ans: _____

$$P = P(S, D) \text{ or } P(D, S) \\ = \frac{13}{52} \times \frac{13}{51} + \frac{13}{52} \times \frac{13}{51} = \frac{2 \times 1}{2} \times \frac{13}{51} = \frac{13}{102} //$$

$$P = \frac{{}^{13}C_1 \times {}^{13}C_1}{{}^{52}C_2} = \frac{13 \times 13}{\frac{52 \times 51}{2}} = \frac{13}{102} //$$

5. Two bottles are randomly selected from a stack of 10 bottles in which 5 are blue, 3 are green, and 2 are yellow. What is the probability that the 1st bottle selected is blue and the 2nd is green?

Ans: _____

$$P = P(B, G) = \frac{5}{10} \times \frac{3}{9} = \frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

(B, G, Y)	(B, G, Y, B)	(Y, B, B, G, Y)
$\frac{5}{10_2} \times \frac{3}{9_3} \times \frac{2}{8_4} = \frac{1}{24}$	$\frac{5}{10_2} \times \frac{3}{9_3} \times \frac{2}{8_4} \times \frac{4}{7} = \frac{1}{42}$	$\frac{2}{10} \times \frac{5}{9} \times \frac{4^2}{8_4} \times \frac{3}{7} \times \frac{1}{6_2}$ $= \frac{1}{9 \times 4 \times 7} = \frac{1}{252}$

6. Three bottles are randomly selected from a stack of 12 bottles in which 3 are black, 4 are white, and 5 are red. What is the probability that all 3 bottles selected are of different colour?

Ans: _____

$$P = P(B, W, R) = \frac{3}{12} \times \frac{4}{11} \times \frac{5}{10} = \frac{1}{22}$$

$$\frac{1}{22} \times 3! = \frac{3 \times 2}{22} = \frac{3}{11}$$

$$P = \frac{{}^3C_1 \times {}^4C_1 \times {}^5C_1}{{}^{12}C_3} = \frac{3 \times 4 \times 5}{12 \times 11 \times 10} = \frac{3}{11}$$

7. Two dice are rolled. What is the probability that the sum of the results is 5?

Ans: _____

$$T = \underline{6} \times \underline{6} = 36$$

F =

D ₁	D ₂
1	4
2	3
3	2
4	1
5	X
6	X

} 4

$$P = \frac{4}{36} = \underline{\underline{\frac{1}{9}}}$$

8. Two dice are rolled. What is the probability that the sum of the results is less than or equal to 5?

Ans: _____

$$T = 6 \times 6 = 36$$

F =

D_1	D_2
1	1, 2, 3, 4
2	1, 2, 3
3	1, 2
4	1
5	X
6	X

} 10

$$P = \frac{10}{36} = \frac{5}{18}$$

9. A fair coin is tossed 6 times. What is the probability that heads turns up exactly 2 times?

Ans: _____

$$T = \underline{2} \quad \underline{2} \quad \underline{2} \quad \underline{2} \quad \underline{2} \quad \underline{2} = 2^6 = 64$$

H H T T T T

H T T T T H

T T T T H H

$$\frac{6!}{2! \times 4!} = \frac{6 \times 5}{2} = 15$$

$$P = \frac{15}{64}$$

10. A bag contains three differently coloured bottles, which include 3 black, 4 white, and 5 red. If 3 bottles are picked randomly from the bag, what is the probability that:

i. All the three are black? Ans: _____

ii. None of them are white? Ans: _____

iii. All of them are not white? Ans: _____

$$i) P(B, B, B) = \frac{3}{12} \times \frac{2}{11} \times \frac{1}{10} = \frac{1}{220} //$$

$$ii) P(\bar{w}) = \frac{{}^8C_3}{{}^{12}C_3} = \frac{\frac{8 \times 7 \times 6}{3 \times 2}}{\frac{12 \times 11 \times 10}{3 \times 2}} = \frac{14}{55} //$$

$$iii) P(w) = \frac{4}{12} \times \frac{3}{11} \times \frac{2}{10} = \frac{1}{55}$$

$$P(\bar{w}) = 1 - \frac{1}{55} = \frac{54}{55} //$$

11. A committee of 10 people needs to be seated on 10 chairs in a straight line. What is the probability that 3 particular people always sit together?

Ans: _____

$$T = 10!$$

$$F = 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ \boxed{8 \ 9 \ 10}$$

$$8! \times 3!$$

$$P = \frac{8! \times 3!}{10!} = \frac{\cancel{3} \times \cancel{2}}{\underset{5}{10} \times \underset{3}{9}} = \frac{1}{15}$$

12. The probability of getting heads in both trials when a balanced coin is tossed twice will be?

- ☒ A. $1/4$ B. $1/2$ C. 1 D. $3/4$

$$\frac{1}{2} \times \frac{1}{2} = \underline{\underline{\frac{1}{4}}}$$

13. A card is drawn from a well-shuffled pack of cards. The probability of getting a queen of club or king of the heart is?

A. 1/52

✓ B. 1/26

C. 1/13

D. None of these

$$\frac{1+1}{52} = \frac{2}{52} = \frac{1}{26}$$

$$\frac{{}^1C_1 + {}^1C_1}{{}^{52}C_1}$$

14. If the probability that A will live 15 years is $\frac{7}{8}$ and that B will live 15 years is $\frac{9}{10}$, then what is the probability that both will live 15 years?

A. $\frac{1}{20}$

✓ B. $\frac{63}{80}$

C. $\frac{1}{5}$

D. None of these

$$P(A^{\vee}, B^{\vee}) = \frac{7}{8} \times \frac{9}{10} = \frac{63}{80}$$

$$P(A^{\times}, B^{\times}) = \frac{1}{8} \times \frac{1}{10} = \frac{1}{80}$$

$$P(A^{\vee}, B^{\times}) \text{ or } P(A^{\times}, B^{\vee}) = \frac{7}{8} \times \frac{1}{10} + \frac{1}{8} \times \frac{9}{10} = \frac{7}{80} + \frac{9}{80} = \frac{16}{80}$$

15. The probability of drawing a red card from a deck of playing cards is

A. 2/18

B. 1/13

C. 1/4

☒ D. 1/2

$$\frac{26}{52} = \underline{\underline{\frac{1}{2}}}$$

16. Two dice are rolled. What is the probability that the sum of the numbers appeared on them is 8 or 11?

A. $1/6$

B. $1/18$

C. $1/9$

☒ D. $7/36$

$$T = 6 \times 6 = 36$$

F =

D_1	D_2
1	x
2	6
3	5
4	4
5	3, 6
6	2, 5

} 7

$$P = \frac{7}{36}$$

17. A bag contains 8 red and 5 white balls. 2 balls are drawn at random. What is the probability that both are white?

A. 5/16

B. 2/13

C. 3/26

✓ D. 5/39

$$\frac{5}{13} \times \frac{\cancel{4}}{\cancel{12}_3} = \frac{5}{39}$$

18. Three unbiased coins are tossed. What is the probability of getting at most 2 heads?

A. $1/4$

B. $3/8$

☒ C. $7/8$

D. $1/2$

H H H
H H T
H T H
H T T
T H H
T H T
T T H
T T T

$\frac{7}{8}$

19. A brother and sister appear for an interview against two vacant posts in an office. The probability of the brother's selection is $\frac{1}{5}$ th and that of the sister's selections is $\frac{1}{3}$ rd. What is the probability that only one of them is selected?

A. $\frac{1}{5}$

✓ B. $\frac{2}{5}$

C. $\frac{1}{3}$

D. $\frac{2}{3}$

$$P = P(B^{\checkmark}, S^{\times}) \text{ or } P(B^{\times}, S^{\checkmark})$$

$$= \frac{1}{5} \times \frac{2}{3} + \frac{4}{5} \times \frac{1}{3}$$

$$= \frac{2}{15} + \frac{4}{15} = \frac{6}{15} = \underline{\underline{\frac{2}{5}}}$$

$$1 - \frac{1}{3} = \frac{2}{3}$$

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

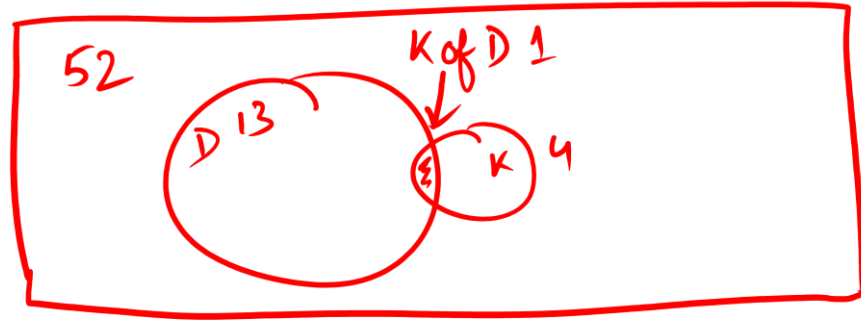
20. The probability that a card drawn from a pack of 52 cards will be a diamond or a king is?

A. $1/13$

☒ B. $4/13$

C. $1/52$

D. $2/13$



$$F = 13 + 4 - 1 = 16$$

$$P = \frac{16}{52} = \frac{4}{13}$$

ANSWER KEY – PROBABILITY

QUESTION	ANSWER	QUESTION	ANSWER
1	1/4	11	1/15
2	1/2	12	A
3	13/204	13	B
4	13/102	14	B
5	1/6	15	D
6	3/11	16	D
7	1/9	17	D
8	5/18	18	C
9	15/64	19	B
10	1/220, 14/55, 54/55	20	B