ULTIMATE KCET

CRASH COURSE 2026

Mathematics | Lecture – 01

Probability

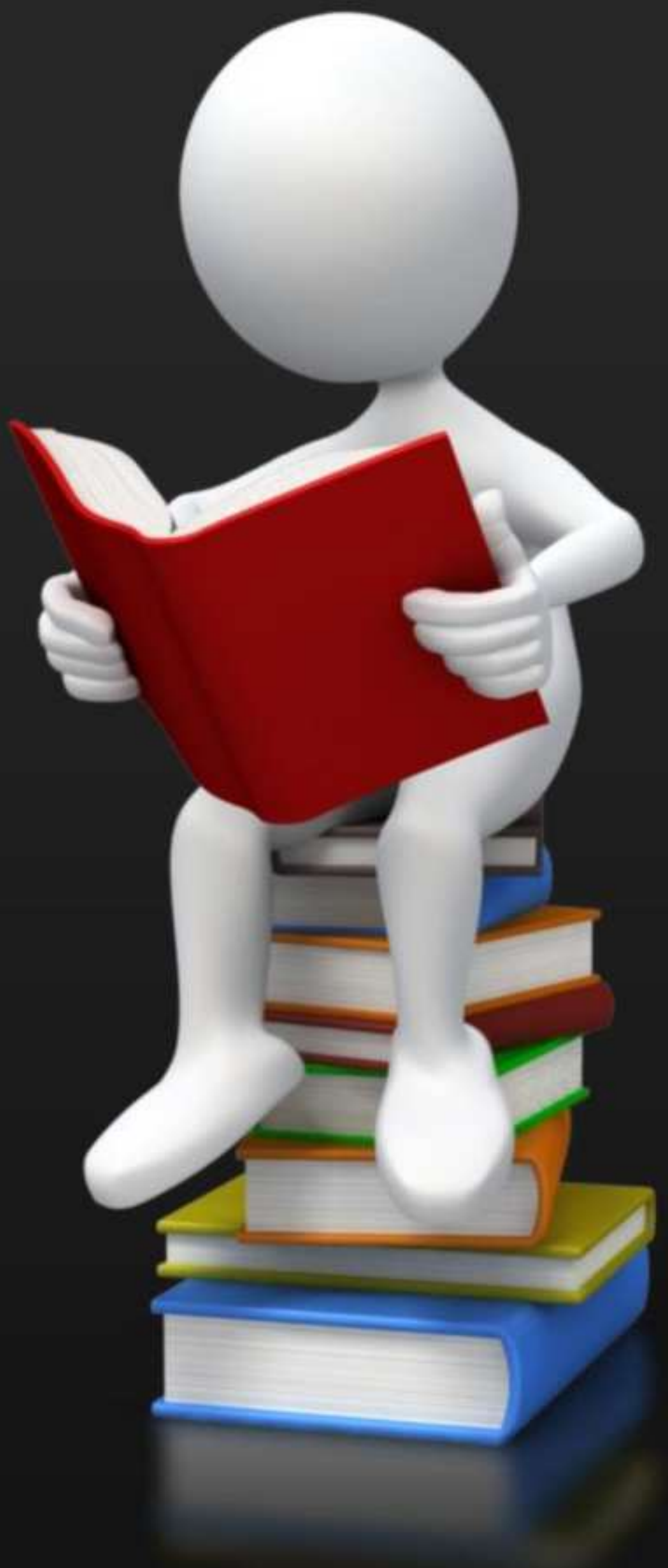
By – Guru sir

Recap *of previous lecture*

1. Differentiation
2.
3.
4.

Topics *to be covered*

1. Conditional Probability
2. Independent events
3.
4.



QUESTION

#Q. Two dice are thrown simultaneously. The probability of obtaining a total score of 5 is

$\rightarrow \frac{4}{36} = \frac{1}{9}$

A 1/9

B 1/18

C 1/36

D 1/12

QUESTION

#Q. If two dice are thrown simultaneously, then the probability that the sum of the numbers which come up on the dice to be more than 5

A 1/6

B 13/18

C 5/36

D 5/18

6, 7, 8, 9, 10, 11, 12

$\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$

5 6 5 4 3 2 1

Sum : 26

$P = \frac{26}{36} = \frac{13}{18}$

QUESTION

#Q. In a simultaneous throw of a pair of dice, the probability of getting a total more than 7 is

A) 7/12

B) 5/36

C) 5/12

D) 7/36

8, 9, 10, 11, 12

$\downarrow$ 5, $\downarrow$ 4, $\downarrow$ 3, $\downarrow$ 2, $\downarrow$ 1

$$P = \frac{15}{36}$$

$$= \frac{5}{12}$$

QUESTION

#Q. Two cards are drawn at random from a pack of 52 cards. The probability of these two being "Aces" is

(A) 1/26

(B) 1/221

(C) 1/2

(D) 1/13

(*) if A & B are mutually exclusive events

Then $P(A \cap B) = 0$

(*) if A, B & C are mutually exclusive events, Then

(1) $P(A \cap B) = 0$

(2) $P(B \cap C) = 0$

(3) $P(A \cap C) = 0$

(4) $P(A \cap B \cap C) = 0$

(*) If A & B exhaustive events

Then $A \cup B = S$

(2) If A, B & C are exhaustive events

Then $A \cup B \cup C = S$

VVV Imp

③ if A & B are mutually exclusive & exhaustive events

Then $\boxed{P(A)+P(B)=1}$

Since ① $P(A\cap B)=0$

② $A\cup B = 1$

④ If A, B & C are mutually exclusive & exhaustive events, Then

$\boxed{P(A)+P(B)+P(C)=1}$

Since

① $P(A\cap B)=0$

② $P(B\cap C)=0$

③ $P(A\cap C)=0$

④ $P(A\cap B\cap C)=0$

⑤ $A\cup B\cup C = S$

QUESTION

#Q. The probability of happening of an event A is 0.5 and that of B is 0.3 . If A and B are mutually exclusive events, then the probability of neither A nor B is

(A) 0.4

(B) 0.5

(C) 0.2 ✓

(D) 0.9

$P(A) = 0.5$

$P(B) = 0.3$

$P(A \cap B) = 0$

$P(A' \cap B') = P(A \cup B)'$

$= 1 - P(A \cup B)$

$= 1 - [P(A) + P(B)]$

$= 1 - 0.8$

$= 0.2$

QUESTION

#Q. If A and B are mutually exclusive events, given that $P(A) = \frac{3}{5}, P(B) = \frac{1}{5}$, then $P(A \text{ or } B)$ is

$\hookrightarrow \frac{3}{5} + \frac{1}{5}$

$= \frac{4}{5} = 0.8$

(A) 0.8

(B) 0.6

(C) 0.4

(D) 0.2

QUESTION

#Q. If A, B, C are three mutually exclusive and exhaustive events of an experiment such that $P(A) = 2P(B) = 3P(C)$, then $P(B)$ is equal to

(A) $2/11$

(B) $3/11$

(C) $4/11$

(D) $1/11$

$P(A) = 2P(B)$

$P(C) = \frac{2}{3}P(B)$

Here $P(A) + P(B) + P(C) = 1$

$P(B)\left[2 + 1 + \frac{2}{3}\right] = 1$

$P(B)\left[\frac{6+3+2}{3}\right] = 1$

$P(B) = \frac{3}{11}$

QUESTION

#Q. The probabilities of three mutually exclusive and exhaustive events A, B, C are given as $P(A) = 2/3, P(B) = 1/4, P(C) = k$. Then $k =$

(A) $12/13$

(B) $1/12$

(C) $11/12$

(D) $1/13$

$$P(A) + P(B) + P(C) = 1$$

$$\frac{2}{3} + \frac{1}{4} + k = 1$$

$$\frac{11}{12} + k = 1$$

$$k = 1 - \frac{11}{12}$$

$$= \frac{1}{12}$$

QUESTION

#Q. If A, B and C are mutually exclusive and exhaustive events of a random experiment such that $P(B) = \frac{3}{2}P(A)$ and $P(C) = \frac{1}{2}P(B)$, then $P(A \cup C) =$

(A) 3/13

(B) 6/13

(C) 7/13

(D) 10/13

WKT

$P(A)+P(B)+P(C)=1$

$P(A)\left[1+\frac{3}{2}+\frac{3}{4}\right]=1$

$P(A)\left[\frac{4+6+3}{4}\right]=1$

$P(A)=\frac{4}{13}$

$P(C)=\frac{1}{2}\left(\frac{3}{2}P(A)\right)$

$=\frac{3}{4}P(A)$

$=\frac{3}{4}\left(\frac{4}{13}\right)$

$=\frac{3}{13}$

$=P(A)+P(C)$

$=\frac{4+3}{13}$

$=\frac{7}{13}$

QUESTION

#Q. If $P(A) = 0.59, P(B) = 0.30$ and $P(A \cap B) = 0.21$, then $P(A' \cap B') =$

$= 1 - P(A \cup B)$

$= 1 - [0.59 + 0.3 - 0.21]$

$= 1 - [0.59 + 0.09]$

$= 1 - 0.68$

$= 0.32$

(A) 0.11

(B) 0.38

(C) 0.32

(D) 0.35

QUESTION

#Q. Let $A = \{x, y, z, u\}$ and $B = \{a, b\}$. A function $f: A \to B$ is selected randomly. The probability that the function is an onto function is

(A) 5/8

(B) 7/8

(C) 1/35

(D) 1/8

no of onto func $= 2^4 - 2 = 16 - 2 = 14$

no of func $= 2^4 = [n(B)]^{n(A)}$

$= 16$

$P(A) = \frac{14}{16} = \frac{7}{8}$

QUESTION

#Q. A die is thrown, where E be the event of getting an even number greater than 4 and F be the event of getting a number not less than 3. Then $E \cap F' =$

$x \not< 3$

$\Downarrow$

$x \geq 3$

$E = \{6\}$

$F = \{3, 4, 5, 6\}$

$F' = S - F = \{1, 2\}$

$E \cap F' = \phi$

(A) $\{1, 2, 6\}$

(B) $\{6\}$

(C) ϕ

(D) $\{1, 2\}$

QUESTION

#Q. If two dice and a coin are tossed simultaneously, then the number of possible events are

Events → Subsets of a sample space

(A) 2^{36}

(B) 72

(C) 36

(D) 2^{72}

$S = \{(1,1,H), (1,2,H), (1,3,H) \ldots (6,6,H),$
$(1,1,T), (1,2,T), \ldots \ldots (6,6,T)\} \Rightarrow 36 + 36 = 72$

$n(S) = 72$

∴ no of events = no of subsets of a sample space S

$= 2^{72}$

QUESTION

#Q. Three coins are tossed once. Find the probability of getting atleast 2 heads

(A) 1/3

(B) 1/4

(C) 1/2

(D) 1/5

$S = \{\underline{HHH}, \underline{HHT}, \underline{HTH}, T\underline{HH}, TTT, TTH, THT, HTT\}$

$n(S) = 8$

$A = \{HHT, HTH, THH, HHH\}$

$n(A) = 4$

$P(A) = \frac{4}{8} = \frac{1}{2}$

Conditional Probability	Independent events
Keywords:- ① without Replacement ② It is given that	Keywords:- ① with Replacement
① $P(A/B) = \frac{P(A\cap B)}{P(B)}$	① $P(A/B) = P(A)$
② $P(B/A) = \frac{P(A\cap B)}{P(A)}$	② $P(B/A) = P(B)$

③ $P(A\cap B) = P(A)\,P(B|A) \rightarrow$ B is dependent on A

or

$P(A\cap B) = P(B)\,P(A|B) \rightarrow$ A is dependent on B

④ $P(A\cap B') = P(A) - P(A\cap B)$

⑤ $P(A'\cap B) = P(B) - P(A\cap B)$

⑥ $P(A'\cap B') = P[(A\cup B)']$

$= 1 - P(A\cup B)$

③ $P(A\cap B) = P(A)\cdot P(B)$

④ $P(A\cap B') = P(A)\cdot P(B')$

⑤ $P(A'\cap B) = P(A')\,P(B)$

⑥ $P(A'\cap B') = P(A')\cdot P(B')$

⑦ $P(A\cup B) = P[\text{Atleast one of } A \,\&\, B]$

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

⑧ $P(A'|B) = 1 - P(A|B)$

⑦ $P(A\cup B) = 1 - P(A')\,P(B')$

⑧ $P(A'|B) = 1 - P(A|B)$

$= 1 - P(A)$

① **Demorgan's law:-**

① $A' \cap B' = (A \cup B)'$

② $A' \cup B' = (A \cap B)'$

② $P(A \cup B) = P($Atleast one of A & B$)$

$= P($either A or B$)$

$= P($A or B$)$

③ $P(A \cap B) = P($Both A & B$)$

④ $P(A' \cap B') = P($Not A & Not B$)$

$= P($neither A nor B$)$

⑤ $P(A \cap B') = P($A but not B$)$

⑥ $P(A' \cap B) = P(B \cap A')$

$= P($B but not A$)$

Atleast one of A & B

$\Downarrow$

minimum one

$A' \cap B' =$ neither A nor B

$\Downarrow$

Both events A & B

will not happen.

(*) if A is a subset of B

(1) $A \cap B = A$

(2) $A \cup B = B$

(1) if $A \subset B$ Then (1) $P(A|B)$

(2) $P(B|A)$

Soln:

$A \subset B$

$\Rightarrow A \cap B = A$

(1) $P(A|B) = \dfrac{P(A \cap B)}{P(B)}$

$= \dfrac{P(A)}{P(B)}$

(2) $P(B|A) = \dfrac{P(A \cap B)}{P(A)}$

$= \dfrac{P(A)}{P(A)}$

$= \underline{1}$

② if $P(B|A) = 1$

Then Relationship b/w A & B

Soln:

$P(B|A) = 1$

$\frac{P(A \cap B)}{P(A)} = 1$

$P(A \cap B) = P(A)$

$\Rightarrow A \cap B = A$

$\Rightarrow A \subset B$

② if $P(A|B) = 0$

Then A is ___

Soln:

$P(A|B) = 0$

$\frac{P(A \cap B)}{P(B)} = 0$

$\Rightarrow P(A \cap B) = 0$ & $P(B) \neq 0$

$\Downarrow$

$\Rightarrow A \cap B = \phi$ $\quad$ $B \neq \phi$

$A = \phi$ (or) A is not a subset of B

(3) if $A \cap B = \phi$ & $P(A) \neq 0$

Then $P(B|A) =$

Soln:

$A \cap B = \phi$

$P(A \cap B) = 0$

$$P(B|A) = \frac{P(A \cap B)}{P(A)}$$

$$= \frac{0}{P(A)} = 0$$

(4) if $P(A)+P(B)-P(A\cap B)=P(A)$

Then Relationship b/w A & B.

Soln:

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

$$\Downarrow$$

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

$$\Rightarrow A\cup B=A$$

$$\Downarrow$$

B is a subset of A.

QUESTION

#Q. If $P(A)=\frac{3}{10}$, $P(B)=\frac{2}{5}$ and $P(A\cup B)=\frac{3}{5}$, then $P(B\mid A)+P(A\mid B)$ equals

(A) 1/4

(B) 1/3

(C) 5/12

(D) 7/12

$$P(A\cap B)=\frac{3}{10}+\frac{2}{5}-\frac{3}{5}$$
$$=\frac{3+4-6}{10}$$
$$=\frac{1}{10}$$

$$\frac{1/10}{3/10}+\frac{1/10}{2/5}$$
$$\frac{1}{3}+\frac{1/10}{4/10}$$
$$\frac{1}{3}+\frac{1}{4}$$
$$=\frac{7}{12}$$

QUESTION

#Q. If $P(A) = \frac{7}{13}, P(B) = \frac{9}{13}$ and $P(A \cap B) = \frac{4}{13}$, then find the value of $P(A \mid B)$ is

$= \frac{4/13}{9/13}$

$= \frac{4}{9}$

A 4/3

B 9/13

C 4/9

D 5/13

52 cards

- 26 Red
  - Suits
    - Heart (13)
    - Diamond (13)
- 26 Black
  - suits
    - club (13)
    - spade (13)

13 cards

2	7	J
3	8	Q
4	9	K
5	10	A
6		

J, Q, K → Face cards

each cards are 4 in no.

⇓

$4 \times 13 = 52$

QUESTION

#Q. One card is drawn from a well shuffled pack of 52 cards. If E is the event "the card drawn is a king or queen" and F is the event "the card drawn is a queen or an ace" then find the probability of the conditional event $E \mid F$.

(A) 1/2

(B) 1/3

(C) 2/13

(D) 3/13

E = King or Queen

$P(E) = \frac{8}{52}$

F = Queen or Ace

$P(F) = \frac{8}{52}$

$P(E|F)$

$= \frac{P(E \cap F)}{P(F)}$

$= \frac{4/52}{8/52}$

$= \frac{1}{2}$

$E \cap F$ = Queen

$P(E \cap F) = \frac{4}{52}$

(A)

Target

KCET

(Youtube)

(B)

Well wishers

⇓

Friends | Seniors |

Teachers | Parents

(C)

Lakshya

Batch

(D)

Random

After Buying

Crash course Batch

How much Happy You are

(A) 90 – 100%

(B) 75 to 90%

(C) 50 – 75%

(D) Sad

QUESTION

$n(S) = 6$

This event has occured first

#Q. A die is rolled if the outcome is an even number. What is the probability that it is a prime?

(A) 2/3

(B) 1/3

(C) 1/6

(D) 1/4

$E = \text{even no} = \{2,4,6\}$ | $F = \text{Prime} = \{2,3,5\}$

$P(E) = \frac{3}{6}$ | $P(F) = \frac{3}{6}$

$E \cap F = \text{Even prime no} = \{2\}$

$P(E \cap F) = \frac{1}{6}$

How F is dependent on E

$P(F/E) = \frac{1/6}{3/6} = \frac{1}{3}$.

QUESTION

10B
5W

#Q. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the probability that both drawn balls are black?

↳ conditional

(A) 5/7

(B) 3/7

(C) 4/7

(D) 6/7

A = First ball is Black

B = second Ball is Black

$$P(A \cap B) = P(A)\,P(B|A)$$

$$= \frac{10}{15}\,\frac{9}{14} = \frac{\cancel{2}^{1}}{\cancel{3}}\,\frac{\cancel{9}^{3}}{\cancel{14}_{7}} = \frac{3}{7}$$

QUESTION

10B
5W

#Q. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the probability that

(1) First ball is Black & second is white (order in which the Ball drawn is given)

(2) one is Black & other is white (order is not given)

Soln:

(1) $P(B)\,P(W)$

$= \frac{10}{15} \cdot \frac{5}{14}$

$= \frac{\cancel{2}}{3} \cdot \frac{5}{\cancel{14}_{7}} = \frac{5}{21}$

(2) $P(B)\,P(W)$ or $P(W)\,P(B)$

$\frac{10}{15} \cdot \frac{5}{14} + \frac{5}{15} \cdot \frac{10}{14}$

$= 2\left(\frac{5}{21}\right) = \frac{10}{21}$

QUESTION

#Q. A bag contains 12 white pearls and 18 black pearls. Two pearls are drawn in succession without replacement. Find the probability that the first pearl is white and the second is black.

(A) 32/145

(B) 28/143

(C) 36/145

(D) 36/143

QUESTION

7 Fuses → 5 Good, 2 Bad $\Longrightarrow$ 6 → 5 Good, 1 Bad

#Q. Suppose that five good fuses and two defective ones have been mixed up. To find the defective fuses, we test them one-by-one, at random and without replacement. What is the probability that we are lucky and find both of the defective fuses in the first two tests?

$\Downarrow$

$= P(1^{st}\text{ Bad})\, P(2^{nd}\text{ Bad})$

$= \frac{2}{7}\,\frac{1}{6}$

$= \frac{1}{7\times 3} = \frac{1}{21}$

(A) 1/42

(B) 2/21

(C) 1/18

(D) ✓ 1/21

QUESTION

20

10 even 10 odd

#Q. A bag contains 20 tickets, numbered 1 to 20. A ticket is drawn and then another ticket is drawn without replacement. (1) Find the probability that both tickets will show even numbers. (2) 1st even & 2nd odd

(3) one is even & one is odd

A 9/38

B 16/35

C 7/38

D 17/30

Sol:-

(1) $P(\text{Both even}) = P(1^{st}\text{ even})\,P(2^{nd}\text{ even})$

$= \frac{10}{20}\,\frac{9}{19} = \frac{1}{2}\,\frac{9}{19} = \frac{9}{38}$

(2) $P(1^{st}\text{ even})\,P(2^{nd}\text{ odd})$

$= \frac{10}{20}\,\frac{10}{19} = \frac{1}{2}\,\frac{10}{19} = \frac{5}{19}$

(3)

$P(1^{st}\text{ even})\,P(2^{nd}\text{ odd})$

or

$P(1^{st}\text{ odd})\,P(2^{nd}\text{ even})$

$= \frac{10}{20}\,\frac{10}{19} + \frac{10}{20}\,\frac{10}{19}$

$= 2\left(\frac{5}{19}\right) = \frac{10}{19}$

QUESTION

#Q. A coin is tossed and then a die is thrown. Find the probability of obtaining a '6' given that head came up.

(A) 1/3

(B) 1/6

(C) 2/3

(D) 1/4

$S = \{(H,1), (H,2) \ldots (H,6)$
$(T,1), (T,2), \ldots (T,6)\}$

$A = \text{obtaining } 6$
$= \{(H,6), (T,6)\}$

$B = \text{Head} = \{(H,1), (H,2), \ldots (H,6)\}$

$A \cap B = \{(H,6)\}$

A is dependent on B

$P(A|B) = \frac{P(A \cap B)}{P(B)}$

$= \frac{1/12}{6/12} = \frac{1}{6}$

QUESTION

$P(A) = 1 - P(A')$
$= 1 - 0.7 = 0.3$

#Q. If $P(\text{not}A) = 0.7, P(B) = 0.7$ and $P(B \mid A) = 0.5$, then find $P(A \mid B)$ and $P(A \cup B)$.

$\frac{0.15}{0.7} = \frac{P(A \cap B)}{P(B)}$

$= \frac{15}{70} = \frac{3}{14}$

(A) $\frac{3}{14}, 0.85$

$P(A \cap B) = P(A)\, P(B \mid A)$
$= (0.3)(0.5) = 0.15$

(B) $\frac{1}{7}, 0.75$

$P(A) + P(B) - P(A \cap B$
$P(A \cup B) = 0.3 + 0.7 - 0.15$
$= 1 - 0.15$
$= 0.85$

(C) $\frac{1}{7}, 0.85$

(D) None of these

QUESTION

#Q. Three events A, B and C have probabilities $\frac{2}{5}, \frac{1}{3}$ and $\frac{1}{2}$, respectively. Given that $P(A \cap C) = \frac{1}{5}$ and $P(B \cap C) = \frac{1}{4}$, then find $P(C/B)/P(A/C)$.

A) 3/5

B) 15/8

C) 2/5

D) None of these

$$\frac{P(B\cap C)}{P(B)} \times \frac{P(C)}{P(A\cap C)}$$

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

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

$$= \frac{15}{8}$$

QUESTION

$n(s) = 216$ $(\_,\_,\_)$

$6 \times 6 \times 6 = 216$

#Q. A die is thrown three times. Events A and B are defined as below: A: '4 on the third throw' and B:' 6 on the first and 5 on the second throw'. Find the probability of A given that B has already occurred.

A) 2/3

B) 1/6

C) 1/7

D) 2/7

A = 4 on Third Throw

$= \left(\begin{smallmatrix}1,2,3\\4,5,6\end{smallmatrix}, \begin{smallmatrix}1,2,3\\4,5,6\end{smallmatrix}, 4\right)$

$n(A) = 6 \times 6 \times 1 = 36$

$P(A) = \frac{36}{216}$

B = 6 on first & 5 on 2nd

$= \left(6, 5, \begin{smallmatrix}1,2,3\\4,5,6\end{smallmatrix}\right)$

$n(B) = 1 \times 1 \times 6 = 6$

$A \cap B = \{(6,5,4)\}$

$n(A \cap B) = 1$

$P(A|B) = \frac{1/216}{6/216} = \frac{1}{6}$

QUESTION

$\to n(S) = 216$

#Q. Three dice are thrown at the same time. Find the probability of getting three two's, if it is known that the sum of the numbers on the dice was six.

A) 1/36

B) 1/6

C) 1/5

D) 1/10

A = getting 3 twos

$A = \{(2,2,2)\}$

$P(A) = \frac{1}{216}$

B = Sum is 6

$(1, \_, \_)$

$$\left.\begin{matrix} 1 & 2 & 3 \\ 1 & 3 & 2 \\ 1 & 4 & 1 \\ 1 & 1 & 4 \end{matrix}\right\} 4$$

$(2, \_, \_)$

$$\left.\begin{matrix} 2 & 2 & 2 \\ 2 & 3 & 1 \\ 2 & 1 & 3 \end{matrix}\right\} 3$$

$(3, \_, \_)$

$$\left.\begin{matrix} 3 & 2 & 1 \\ 3 & 1 & 2 \end{matrix}\right\} 2$$

$(4, \_, \_)$

$$\left.\begin{matrix} 4 & 1 & 1 \end{matrix}\right\} 1$$

$n(B) = 10$

$P(B) = \frac{10}{216}$

$$A \cap B = \{(2,2,2)\}$$

$$n(A \cap B) = 1$$

$$P(A \cap B) = 1/216$$

$$P(A|B) = \frac{1/216}{10/216} = \frac{1}{10}$$

QUESTION

#Q. A card is picked at random from a pack of 52 playing cards. $\boxed{\text{Given that}}$ the picked card is a queen, the probability of this card to be a card of spade is

event A has occured first

(A) 1/3

(B) 4/13

(C) 1/4

(D) 1/2

$P(A) = \frac{4}{52}$ = Queen

B = spade

$P(B) = \frac{13}{52}$

$A \cap B$ = Card is Queen of spade

$P(A \cap B) = \frac{1}{52} = \frac{\text{Queen is spade}}{\text{Total cards}}$

B is dependent on A

$P(B|A) = \frac{1/52}{4/52} = \frac{1}{4}$

Sum of outcomes of 2 dice	outcomes	Total
2	(1,1)	1
3	(1,2),(2,1)	2
4	(1,3),(3,1),(2,2)	3
5	(1,4),(4,1),(2,3),(3,2)	4
6	(1,5),(5,1),(2,4),(4,2),(3,3)	5
7	(1,6),(6,1),(2,5),(5,2),(3,4),(4,3)	6 Peak
8	(2,6),(6,2),(3,5),(5,3)(4,4)	5
9	(3,6),(6,3),(4,5),(5,4)	4
10	(4,6),(6,4),(5,5)	3
11	(5,6),(6,5)	2
12	(6,6)	1

QUESTION

$\rightarrow n(S)=36$

$\rightarrow$ A has occurred first

#Q. A $\boxed{\text{dice is thrown twice}}$ and the sum of the numbers appearing is observed to be 6. What is the conditional probability that the number 4 has appeared at least once ?

A) 1/5

B) 2/5

C) 3/5

D) 4/5

A = Sum is 6

$P(A)=\frac{5}{36}$

B = Four is appeared At least once

$B=\{(4,1),(4,2)\ldots(4,6),(1,4),(2,4),(3,4),(5,4),(6,4)\}$

$P(B)=\frac{11}{36}$

$A\cap B=\{(2,4),(4,2)\}$

$P(A\cap B)=\frac{2}{36}$

B is dependent on A

$P(B|A)=\frac{2/36}{5/36}=\frac{2}{5}$

QUESTION

#Q. If $P(A) = \frac{4}{5}$ and $P(A \cap B) = \frac{7}{10}$, then $P(B \mid A)$ is equal to

$\Downarrow$

$\frac{7}{8}$

A 1/10

B 1/8

C 7/8

D 17/20

QUESTION

#Q. Given $P(A) = 0.4, P(B) = 0.7$ and $P(B \mid A) = 0.6$. Find $P(A \cup B)$.

$$\Downarrow$$

$$0.4 + 0.7 - 0.24$$
$$= 0.7 + 0.16$$
$$= \underline{0.86}$$

$$P(A \cap B) = (0.4)(0.6)$$
$$= 0.24$$

(A) 0.4

(B) 0.6

(C) 0.15

(D) 0.86

QUESTION

#Q. Given that $P(A) = 0.1, P(B) = 0.6$ and $P(B \mid A) = 0.3$ what is $P(A \mid B)$?

$$P(A \cap B) = (0.1)(0.3)$$
$$= 0.03$$

$$\frac{0.03}{0.6}$$
$$= \frac{3}{60}$$
$$= \frac{1}{20}$$

QUESTION

#Q. If $P(A) = \frac{3}{8}, P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{4}$, then find $P(\bar{A} \mid \bar{B})$.

$$\frac{P(A' \cap B')}{P(\bar{B})} = \frac{P(A \cup B)'}{1 - P(B)}$$

(A) 0.32

$$P(A \cup B) = \frac{3 + 4 - 2}{8}$$

$$= \frac{5}{8}$$

(B) 0.48

$$= \frac{1 - P(A \cup B)}{1 - P(B)}$$

(C) 0.2

$$= \frac{3/8}{1/2} = \frac{3}{4}$$

(D) None of these

QUESTION

$P(A\cap B) = \frac{3}{10}$

$P(A) = \frac{4}{5} + \frac{3}{10} - \frac{3}{5} = \frac{1}{2}$

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

#Q. If $P(B) = \frac{3}{5}, P(A \mid B) = \frac{1}{2}$ and $P(A \cup B) = \frac{4}{5}$, then find $P(A \cup B)' + P(A' \cup B)$.

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

$= \underline{1}$

$P(A\cup B)' = 1 - P(A\cup B)$

$= \frac{1}{5}$

A) 1/5

B) 4/5

C) 1/2

D) ✓ 1

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

$= \frac{1}{2} + \frac{3}{5} - [P(B) - P(A\cap B)]$

$= \frac{1}{2} + \cancel{\frac{3}{5}} - \cancel{\frac{3}{5}} + \frac{3}{10}$

$= \frac{8}{10} = \frac{4}{5}$

QUESTION

#Q. A pair of dice is thrown. If the two numbers appearing on them are different, find the probability that the sum of the numbers is 6.

A 2/9

B 2/15

C 1/5

D 1/9

$n(A) = \text{Total} - \{(1,1),(2,2),(3,3),(4,4),(5,5),(6,6)\}$

$= 36 - 6 = 30 \Rightarrow P(A) = \frac{30}{36}$

B = Sum is 6

$n(B) = 5$

$P(B) = \frac{5}{36}$

$A \cap B = \{(1,5),(5,1)$
$(2,4),(4,2)\}$

$P(A \cap B) = \frac{4}{36}$

B is dependent on A

$P(B|A) = \frac{4/36}{30/36}$

$= \frac{4}{30} = \frac{2}{15}$

QUESTION

$\boxed{\begin{matrix} 5R \\ 3B \end{matrix}}$

$$\frac{{}^5C_1 \times {}^3C_2}{{}^8C_3} = \frac{5 \times 3}{\frac{8}{3} \times \frac{7}{2} \times 6} = \frac{15}{56}$$

#Q. A bag contains 5 red and 3 blue balls. If $\boxed{\text{3 balls}}$ are drawn at random $\boxed{\text{without replacement}}$, then the probability of getting exactly one red ball is

→ order is not mentioned

A 45/196

B 135/392

C 15/56

D 15/29

$$P(R_1)\,P(B_2)\,P(B_3) \text{ or } P(B_1)\,P(R_2)\,P(B_3) \text{ or } P(B_1)\,P(B_2)\,P(R_3)$$

$$= \frac{5}{8}\,\frac{3}{7}\,\frac{2}{6} + \frac{3}{8}\,\frac{5}{7}\,\frac{2}{6} + \frac{3}{8}\,\frac{2}{7}\,\frac{5}{6}$$

$$= 3\left[\frac{\cancel{30}^{5}}{8 \times 7 \times \cancel{6}_{1}}\right]$$

$$= \frac{15}{56}$$

QUESTION

2W
3R
5G
4B

$\Rightarrow$ Total = 14

#Q. Two balls are drawn at random from a bag containing 2 white, 3 red, 5 green and 4 black balls, one by one without replacement. Find the probability that both the balls are of different colours.

(A) 70/93

(B) 71/91

(C) 61/72

(D) 5/6

$2P(W)P(R) + 2P(W)P(G) + 2P(W)P(B) + 2P(R)P(G) + 2P(R)P(B) + 2P(G)P(B)$

$= 2\left[\frac{2}{14}\frac{3}{13} + \frac{2}{14}\frac{5}{13} + \frac{2}{14}\frac{4}{13} + \frac{3}{14}\frac{5}{13} + \frac{3}{14}\frac{4}{13} + \frac{5}{14}\frac{4}{13}\right]$

$= \cancel{2}\left[\frac{6+10+8+15+12+20}{\cancel{14}_{7} \times 13}\right] = \frac{71}{7 \times 13} = \frac{71}{91}$

QUESTION

$$\boxed{\begin{matrix} 3O \\ 3G \\ 2B \end{matrix}} \Rightarrow \text{Total} = 8$$

#Q. A box contains 3 orange balls, 3 green balls and 2 blue balls. Three balls are drawn at random from the box without replacement. The probability of drawing 2 green balls and one blue ball is

(A) 3/28

(B) 2/21

(C) 8/28

(D) 167/168

$$P(G)P(G)P(B) + P(G)P(B)P(G) + P(B)P(G)P(G)$$

$$= \cancel{3}\left[\frac{3}{8}\cdot\frac{2}{7}\cdot\frac{\cancel{2}^{2}}{\cancel{6}}\right]$$

$$= \frac{6}{56} = \frac{3}{28}$$

QUESTION

#Q. If A and B are two events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \mid B) = \frac{1}{4}$, then $P(A' \cap B')$ equals to

$P(A \cap B) = \frac{1}{12}$

(A) 1/12

(B) 3/4

(C) 1/4

(D) 3/16

$P(A \cup B)'$

$= 1 - P(A \cup B)$

$= 1 - \left[\frac{1}{2} + \frac{1}{3} - \frac{1}{12}\right]$

$= 1 - \left[\frac{6+4-1}{12}\right]$

$= 1 - \frac{3}{4} = \frac{1}{4}$

Thank

You