Q Find Prob of a Leap year.

A) having 53 Sunday.

$52 \times 7 = 364$ days.

In a leap year We have
2 days Remaining.

Psblities $= \{SM, MT, TW, WTh, ThF, FSa, SaSu\}$

$P(53 \text{ Sunday}) = \frac{2}{7}$

(B) Prob. of 53 Monday.

$P(53 \text{ Monday}) = \frac{2}{7}$

(C) Prob of 53 Sunday & 53 Monday.

$= \frac{1}{7}$

(D) Prob of 53 Sundays or 53rd Monday

$= \frac{3}{7}$ SM, MT, SaS

(E) Prob of 52nd Sunday.

$= \frac{5}{7}$

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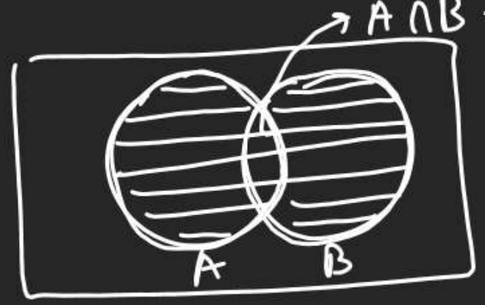
Generalised Addition Theorem :- [IIT.

(1) Prob of happenning one Event A or B.

= Prob of happenning atleast one Event A or B.

= P(A or B) = P(A ∪ B) = P(A+B)

(2)



P(A ∪ B) = P(A) + P(B) − P(A ∩ B)

is hen. Addition Theorem

Mutually Exclusive Events

ME Events.

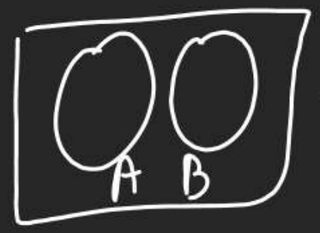
(1) happenning of one event Stops happenning of other then it is known as ME Event

(2) A & B are ME Event.

A hoga ⇒ B nahi hoga

& B hoga ⇒ A nahi hoga

⇒ A & B both have no string com.



⇒ A ∩ B = ϕ

P(A ∩ B) = 0

(3) If A & B are ME then

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

(4) $0 \le P(A) \le 1$

$0 \le P(B) \le 1$

$0 \le P(A \cup B) \le 1$

$0 \le P(A) + P(B) \le 1$

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Q Prob on throw of 2 Dices.

(A) Either Sum=8 or having Eql No.

$$P(\text{Sum}=8 \cup \text{Eql No}) = P(\text{Sum}=8) + P(\text{Eql No}) - P(\text{Sum}=8 \cap \text{Eql No})$$

(4,4)

$$= \frac{13-8}{36} + \frac{6}{36} - \frac{1}{36} = \frac{10}{36}.$$

ME

(B) P(Either Sum=9 or Eql No) = P(S=9) + P(Eql) − P(S=9 & Eql No)

$$= \frac{13-9}{36} + \frac{6}{36} - 0 = \frac{10}{36}$$

(C) P(Sum=Even OR less than 5) = P(S=E) + P(<5) − P(S=E ∩ S<5)

S=2 or S=4

$$= \frac{(2-1)+(4-1)+(6-1)+(3-8)+(13-10)+(13-12)}{36} + \frac{(2-1)+(3+1)+(4+1)}{36} - \frac{(2-1)+(4-1)}{36}$$

$$= \frac{18}{36} + \frac{2}{36} = \frac{20}{36}$$

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Q A Bag has 20 Apple & 10 Oranges
In there half of them are Rotten
If we Randomly Select 2 fruits
find Prob. that Both are Apple
or good fruit.

Good fruit = 15
Good Apple = 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

$$P(\text{App.} \cup \text{good}) = P(\text{Apple}) + P(\text{good}) - P(\text{App} \cap \text{good})$$

$$= \frac{{}^{20}C_2}{{}^{30}C_2} + \frac{{}^{15}C_2}{{}^{30}C_2} - \frac{{}^{10}C_2}{{}^{30}C_2}$$

Q An Int. is selected from 1st 100 Natural No.
find Prob that it is divisible by 4 OR 6.

$$P(\div 4 \cup \div 6) = P(\div 4) + P(\div 6) - P(\div 4 \cap \div 6)$$

$\div 12$

$$\frac{\{4,8,12 \ldots 100\}}{100} + \frac{\{6,12,18 \ldots 96\}}{100} - \frac{\{12,24 \ldots 96\}}{100}$$

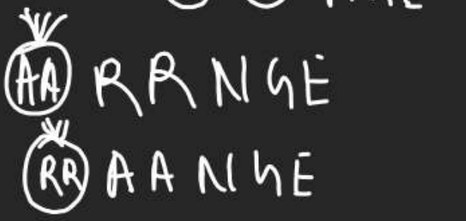
$$= \frac{25}{100} + \frac{16}{100} - \frac{8}{100} = \frac{33}{100}$$

Q 3 Integers are Randomly Selected from
1 to 10 Natural No. find Prob. that
Min^m Selected No is 3 OR Max^m Selected No is

$$P(\text{Min}^m 3 \cup \text{Max } 7) = \frac{1 \times 7_{C_2}}{10_{C_3}} + \frac{6_{C_2} \times 1}{10_{C_3}} - \frac{1 \times 3_{C_1} \times 1}{10_{C_2}}$$

$$= \frac{7_{C_2}}{10_{C_3}} + \frac{6_{C_2}}{10_{C_3}} - \frac{3_{C_1}}{10_{C_3}}$$

Q) A Word is selected from all Words made Using Alphabets of ARRANGE find Prob. that Selected Word has Both A or Both R together.



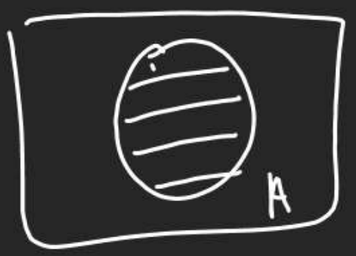
total Words from ARRANGE $= \frac{7!}{2!\,2!}$

$$P\left(\begin{matrix}\text{या A इकट्ठे हों}\\ \text{OR}\\ \text{या R इकट्ठे हों}\end{matrix}\right) = P(\text{When Both A together}) + P(\text{When both R together}) - P(\text{When Both A \& Both R together})$$

$$= \frac{\frac{6!}{2!}}{\frac{7!}{2!2!}} + \frac{\frac{6!}{2!}}{\frac{7!}{2!2!}} - \frac{5!}{\frac{7!}{2!2!}}$$

Venn Diagram

(1) P(A)



(2) $P(\bar{A})$ = Prob of not occuring of A

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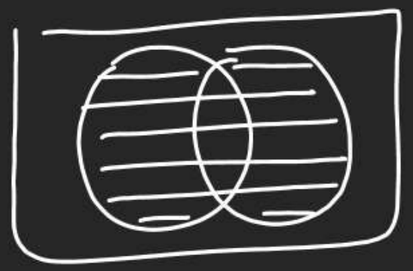
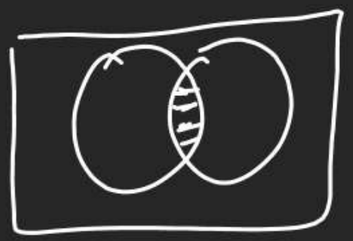
(3) $P(A \cup B)$ = Prob of happenning of Atleast one of A & B.



(4) $P(A \cap B)$ = Prob of happenning of Both A & B



(5) $P(A \cap \bar{B})$ = Prob of happenning Only A

$P(A \cap \bar{B}) = P(A) - P(A \cap B)$

(6) $P(\bar{A} \cap B)$ = Only B

$P(\bar{A} \cap B) = P(B) - P(A \cap B)$

(7) $P((\bar{A} \cap B) \cup (A \cap \bar{B}))$

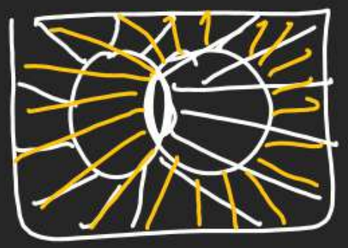
Only A or only B

Exactly A or Exactly B

$\Rightarrow P((\bar{A} \cap B) \cup (A \cap \bar{B}))$

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

(8) $P(\bar{A} \cup \bar{B})$ = Not A or Not B.



= White + yellow part

Jod Ke

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

$P(\bar{A} \cup \bar{B}) = P(\overline{A \cap B})$

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

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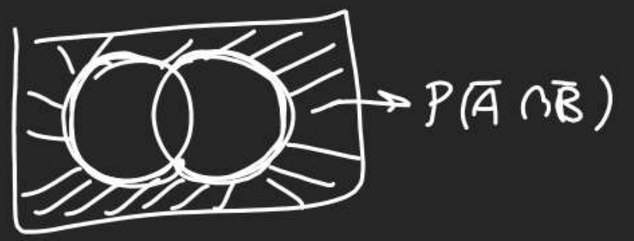
(9) $P(\bar{A} \cap \bar{B}) = ?$

$P(\bar{A} \cap \bar{B}) = P(\overline{A \cup B})$

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

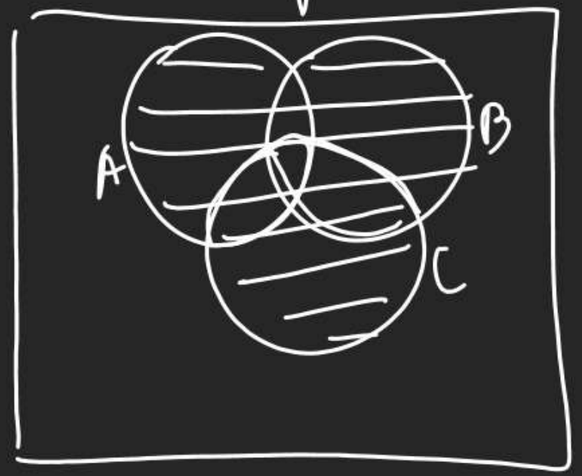


$P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C) + P(A \cap B \cap C)$

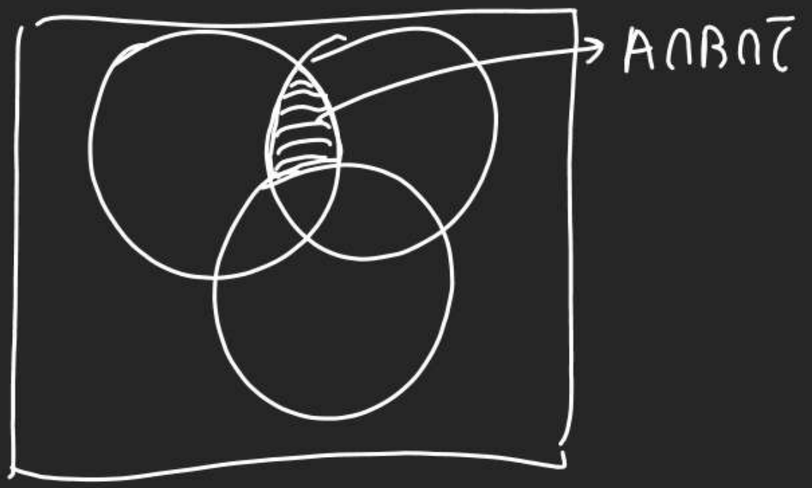
$P(A \cup B \cup C) = \sum P(A) - \sum P(A \cap B) + P(A \cap B \cap C)$

(10) When A, B, C Three events happening.

$P(A \cup B \cup C)$ = Prob of at least one of A or B or C.



(11) $P(A \cap B \cap \bar{C})$ = Prob of happening of A & B but not C



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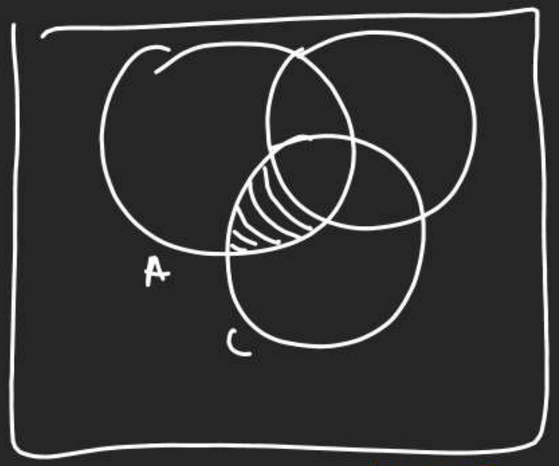
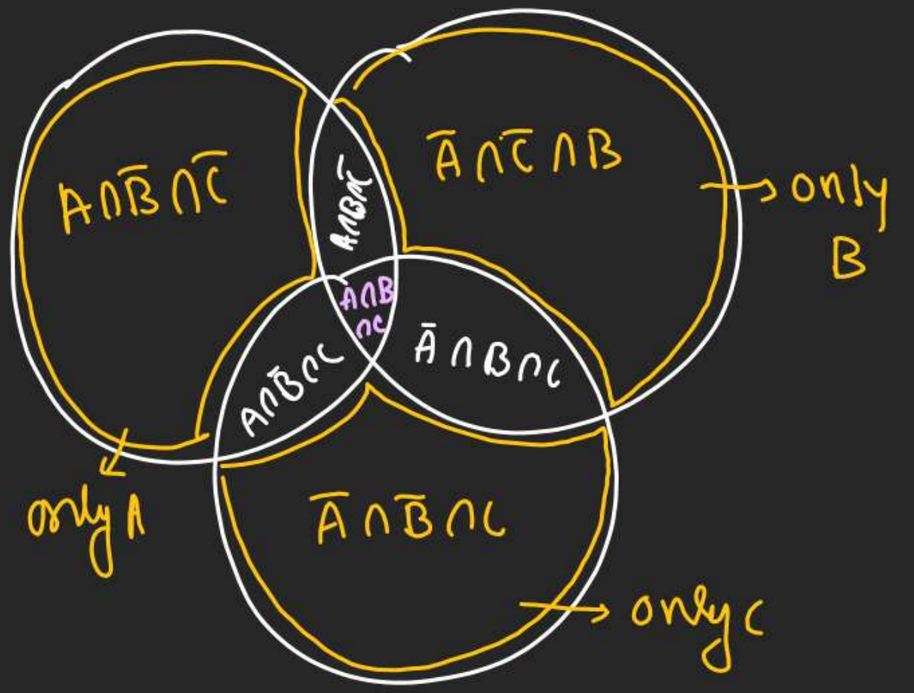
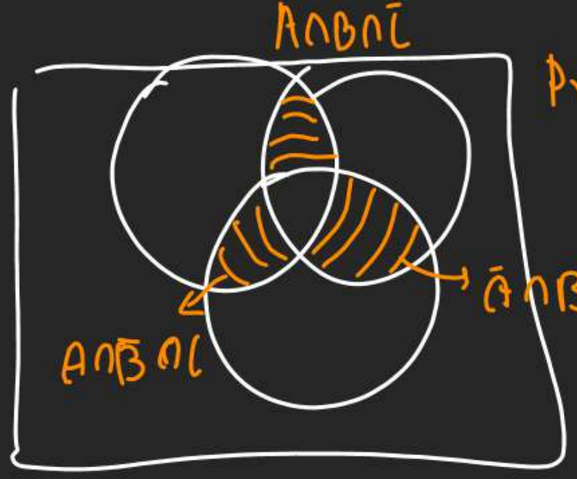
(12) $P(A \cap \bar{B} \cap C)$ = Prob. ... of A & C but not B.





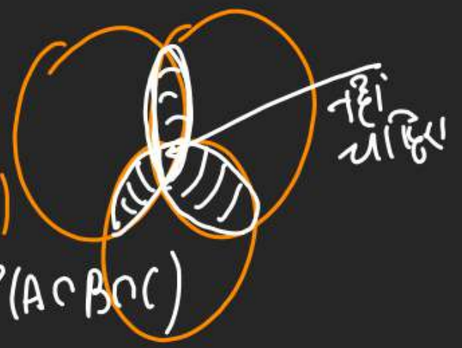
Exactly one of A, B, C

(13)



Prob of happening of Exactly 2 Events

$= P(A \cap B) + P(B \cap C) + P(A \cap C) - 3P(A \cap B \cap C)$



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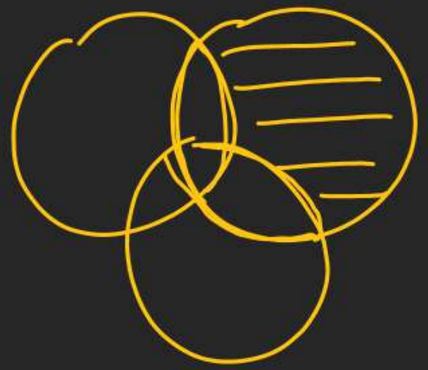
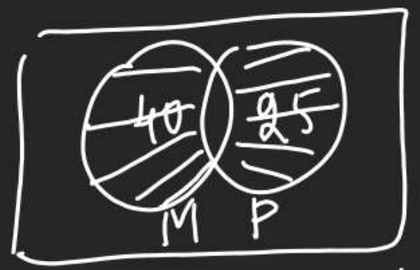
Q Prob of happenning only B in A, B, C = ?



$P(\bar{A} \cap B \cap \bar{C}) = P(B) - P(A \cap B) - P(B \cap C) + P(A \cap B \cap C)$

Q A Class has 125 Students in which 70 in Maths. 55 in Physics & 30 in both. Passed. If A Student is Randomly Selected find Prob of him to be passed in Exactly one subject..

$P((M \cap \bar{P}) \cup (\bar{M} \cap P))$



$= P(M) + P(P) - 2P(M \cap P)$

$\frac{70}{125} + \frac{55}{125} - 2 \times \frac{30}{125}$

$= \frac{65}{125}$

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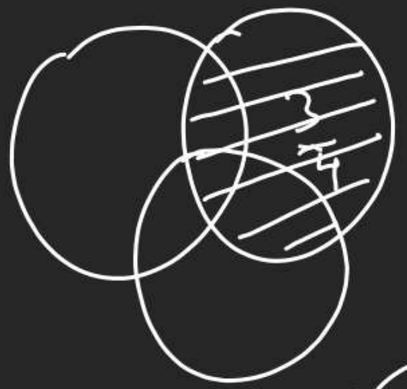
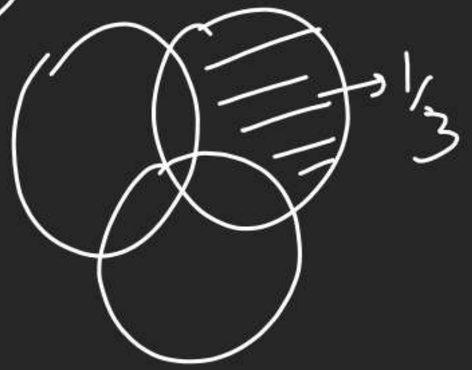
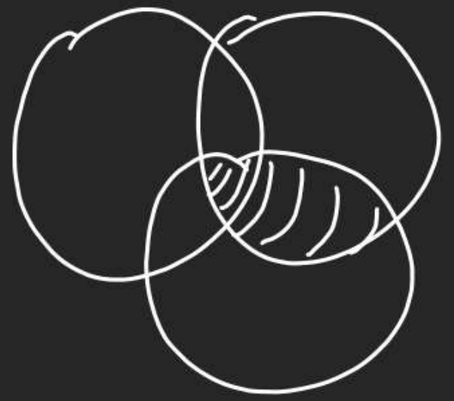
Q $P(B) = \frac{3}{4}$, $P(A \cap B \cap \bar{C}) = \frac{1}{3}$

$P(\bar{A} \cap B \cap \bar{C}) = \frac{1}{3}$.

find $P(B \cap C) = ?$







$P(B \cap C) = P(B) - P(A \cap B \cap \bar{C})$

$- P(\bar{A} \cap B \cap \bar{C})$

$= \frac{3}{4} - \frac{1}{3} - \frac{1}{3} = \frac{3}{4} - \frac{2}{3}$

$= \frac{9-8}{12}$

$= \frac{1}{12}$