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Q1: A man throws fair dice what is the conditional Probality that the sum of the two dice be 7, given that

Ans:

(1,1) (1,2) (1,3) (1,4) (1,5) (1,6) (1,7) (1,8)
(2,1) (2,2) (2,3) (2,4) (2,5) (2,6) (2,7) (2,8)
(3,1) (3,2) (3,3) (3,4) (3,5) (3,6) (3,7) (3,8)
(4,1) (4,2) (4,3) (4,4) (4,5) (4,6) (4,7) (4,8)
(5,1) (5,2) (5,3) (5,4) (5,5) (5,6) (5,7) (5,8)
(6,1) (6,2) (6,3) (6,4) (6,5) (6,6) (6,7) (6,8)
(7,1) (7,2) (7,3) (7,4) (7,5) (7,6) (7,7) (7,8)
(8,1) (8,2) (8,3) (8,4) (8,5) (8,6) (8,7) (8,8)

A = {The sum is 7}
B = {The sum is even}
C = {The sum is greater than 8}
D = {The ~~sum~~ two dise had the same out comes}

Now: $A \{1,6\} \{2,5\} (3,4) (5,2) (6,1) (4,3) \}$

$B = \{(1,1) (1,3) (1,5) (1,7) (2,2) (2,4) (2,6)$
$(2,8) (3,1) (3,3) (3,5) (3,7) (4,2)$
$(4,4) (4,6) (4,8) (5,1) (5,3) (5,5) (5,2) (6,2)$
$(6,4) (6,6) (6,8) (7,1) (7,3) (7,5), (7,7)$
$(8, \cancel{2}) (8,4) (8,6) (8,8)\}$

(C) $(1,8) (2,1) (2,8) (3,6) (3,7) (3,8$
$(4,5) (4,6) (4,7) (4,8) (5,4) (5,5) (5,6) (5,7)$
$(5,8) (6,3) (6,4) (6,5) (6,6) (6,7) (6,8)$
$(7,2) (7,3) (7,4) (7,5) (7,6) (7,7) (7,8)$
$(8,1) (8,2) (8,3) (8,4) (8,5) (8,6) (8,7$
$(8,8)\}$

$D = \{(1,1) (2,2) (3,3) (4,4) (5,5) (6,6)$
$(7,7) (8,8)\}$

$A \cap B = \{ \}$ OR b
$A \cap B = \{ \}$
$A \cap D = \{ \}$

$P(A = 6/64 = P(B) = 32/64$
$P(= \frac{36}{64}, P(B) = 32/64$

$P(C) = \frac{36}{64} \quad P(B) = 32/64$

PD

$P(A \cap B = 0 \quad P(A \cap C) = 0, P(A \cap D) = 0$

Name = $P(A/B) = \frac{P(A \cap B}{B} = 0 \times 32/64$
$P(A/B) = 0$

$\cancel{A}$ $P(A/C) = P(A \cap C) = 0 \times 36/64$
$P(A/C) = 0$

$P(A/D) = \frac{P(A \cap D)}{} = 0 \times 8/64$
$P(A/D = 0$ Ans

Q 3:

exculy 4 games
at least 4 games
from 3 to 6 games

Sol:

$p = 2/3 \quad n = 8$

$q = 1 - p$

$= 1 - 2/3 \quad q = 1/3$

$P(X = 4)$

$= \binom{8}{4} (2/3)^4 (1/3)^4$

$= \frac{1120}{656} = 0.1707$

$P(X = 4)$

$1 - P(X = 4)$

$1 - \sum^{3} \binom{8}{x} \left(\frac{2}{3}\right) \left(\frac{2}{3}\right)^{x} \left(\frac{1}{3}\right)^{8-x}$

$= 1 - \left[\left(\frac{1}{3}\right)^8 + 8\left(\frac{2}{3}\right)\left(\frac{1}{3}\right)^7 + 28\left(\frac{2}{3}\right)^2\left(\frac{1}{3}\right)^6 + 56 \left(\frac{2}{3}\right)^3\left(\frac{1}{3}\right)^5\right]$

$= 1 - \frac{1}{656}\left[1 + 16 + 112 + 448\right]$

$= 1 - \frac{577}{6561}$

$= \frac{6561 - 577}{6561}$

$= 5984/6561$

$= 0.9121$

(i) $P(3 < x \leq 6)$

$$\sum \binom{8}{x} \left(\frac{2}{3}\right)^x \left(\frac{1}{3}\right)^{8-x}$$

$$\left(\frac{8}{3}\right)\left(\frac{2}{3}\right)\left(\frac{1}{3}\right)^5 + \left(\frac{8}{4}\right)\left(\frac{2}{3}\right)^4\left(\frac{1}{3}\right)^4 + \left(\frac{8}{3}\right)\left(\frac{2}{3}\right)\left(\frac{1}{3}\right)$$

$$\left[\frac{3}{6}\right]\left[\frac{2}{3}\right]\left(\frac{1}{3}\right)^2$$

$$\frac{8}{(3)^3}\left(56 + 146 + 224 + 224\right)$$

$$= \frac{8 + 644}{6561} = \frac{5152}{6561} = 0.7852$$

Q 68

sol:-

A Binomical distribution can be thouph of as simply the Probality of as simply the probality of a Sucess or fieature out cone in an experement or Sevrey that is repeated multiply Jemul

$$P(x-X) f(x) = {}^{n}C_{x} p^{x} q^{n-x}$$

Bionimal frequency Distrobibion:-

if the Bionomal Problality distrobution is multiply by N the number of experement or set the derely distrubation is know as Bionomial frequency Distribution

$$N \binom{N}{x} (p^{x} q^{n-x})$$

Q4:

Ans: Proof:-

Since the C_is from partition of the sample space we can apply the law of total probablity for A, B

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

$P(A \cap B) = \sum_{i=1}^{m} P(A | C_i) P(B | C_i) P(C_i)$

:- (A and B are conditionally independent.

$A \cap B \sum_{i=1}^{m} P(A) (C_i) P(B) P(i)$

:- (B is indepentent of all C_i

$P(A \cap B) = P(B) \sum^{m} P(A) (C_i\ P_C(i)$

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

law of total probability

Hence A and B are independly

Q23
Sum of 2 has way 1,1
Sum of 3 has 2way 1,2, and 2,1
Sum of 4, has 3 way
{1,3, 2, 2, 3, 1
5 has 4 ways
6 has 5 ways (symetic)
9 has 4 ways
10 has 3 ways
11 has 2 ways
12 has 1 ways
Those are 15/36 for each side with a sum of
30/36 that level a
6/36 = 1/6
Probablity for sum of
7

Q 7:

Solution

Measure	~~B~~ Date set A	B	C	D
coefficient of variation	$CV = \frac{3}{45} \times 100$ $CV = 6.7$	$CV = \frac{11}{60} \times 100$ $CV = 18.3$	$CV = \frac{5}{50} \times 100$ $CV = 10$	$CV = \frac{15}{25} \times 100$ $CV = 60$

Q5:
Ans: Mean & variance of Bionomal Random variable.
The Probability funcation for a bionomal random variable is $b(n; n, P) (= (\frac{x}{n}) p^x (1-P)^{n-x}$.

This is the Probability of having a successful in a series of indepeneds traids when the probality of sucess is any one of Probality the traits is p if x is a random variables win the Probality distrubtion

$$E(x) = \sum_{x=0} \left(\frac{n}{x}\right) p^x (1-p)^{(n-n}$$

$$= \sum_{x=0}^{n} y \frac{x!}{x!(x-x)} p^y (1-p)^x$$

$$= \sum_{x=1}^{n} \frac{x!}{(x-1)(x-y)} p^y (1-p)^x$$

Since $x=0$ term vanius tex $y=x$ and $m=n-1$ Subbing $n=y$ lamed

and $m=n-1$ Subbing $n=y$ $y=1$ and $m+1$ into the deit sum.

$y = x = 2$ and $m2 = a\ 2$

$E(n-1) = \sum_{x=0}^{4} x((x-1)) \binom{4}{x} p^3 (1-p)^{n-x}$

$\sum_{4=0}^{4} x(x-1) \frac{x!}{x!(x-4)!} p^2 (1-p)^{x-4}$

$= \sum_{1=2}^{n} \frac{n!}{(2,2)(a-x)} p^x (1-p)^{n-m}$

So the variance of ~~x~~ is

$(x2) c(E(xy)) = E(x(x-1)) + (E(x))$

$E(x^2) = (x(x-1)) p2 + nP(nP$

$= \boxed{nP(1-P}$