Peobability.

30-9-19

- When we throw a coin either head or tail appears.
- Tossing a coin, $S = \{H, T\}$.
  If 2 coins are tossed,
  $S = \{HT, TH, TT, HH\}$
  In rolling a dice, we have
  $S = \{1, 2, 3, 4, 5, 6\}$
- Let S be the sample space of E be an event then $E \subseteq S$

$$\therefore P(E) = \frac{n(E)}{n(S)}$$

Q. In a throw of a coin find a probability of getting a Head.

$S = \{H, T\}$.

$E = \{H\}$

$n(S) = 2 \quad ; n(E) = 1.$

$$\therefore P(E) = \frac{n(E)}{n(S)} = \frac{1}{2}.$$

Q. Two unbaised coins are tossed, What is the probabity of getting at most 1 head.

$S = \{HH, HT, TH, TT\}$

$E = \{HT, TH, TT\}$

$n(E) = 7$

$p(E) = \frac{7}{21} = \frac{1}{3}$

Q. What is the probability of getting a sum 9 from 2 throws of a dice.

$S = \{(1,1), (1,2), (1,3), (1,4), (1,5), (1,6)$

$(6,1) \ldots\ldots (6,6)\}$

$E = \{(3,6), (4,5), (5,4), (6,3)\}$

$p(E) = \frac{n(E)}{n(S)} = \frac{4}{36} = \frac{1}{9}$

Q. 3 unbaised coins are tossed, what is the probability of getting at most 2 head.

$S = \{(HHH), (HHT), (HTH), (HTT), (THT), (TTH)$
$(THH), (TTT)\}$

$E(=7)$

$\therefore p(E) = \frac{n(E)}{n(S)} = \frac{7}{8}$

Q. 2 dice are thrown simultaneously. What is the probability of getting 2 nos whose product is even.

$n(S) = \{(1,1), (1,2) \ldots\ldots (1,6)$

$(6,1) \ldots\ldots (6,6)\}$

$n(E) = \{(2,1)\ (4,1)\ (6,1), (2,1) \cdots (2,6)$
$(3,2); (3,4)\ (3,6)(4,1) \cdots (4,6)$
$(5,2), (5,4)\ (5,6)(6,1) \cdots (6,6)$

$P(E) = \frac{n(E)}{n(S)} = \frac{27}{36} = \frac{3}{4}$

Q. Two dice are tossed. The probability that the two score is a prime no.

$n(E) = \{(1,1) \cdots (1,6)$
$\vdots$
$(6,1) \cdots (6,1)$

$n(E) = \{(1,1), (1,2), (1,4), (1,6), (2,1), (2,3)$
$(2,5), (3,2), (3,4), (4,1), (4,3), (5,2)$
$(6,1), (6,5), (5,6)$

$P(E) = \frac{n(E)}{n(S)} = \frac{15}{36} = \frac{5}{12}$

Q. A card is drawn from a packet of 52 cards. The probability of getting a queen of Club or a king of heart

$P(E) = \frac{2}{52} = \frac{1}{26}$

Q. Two cards are drawn together from a pack of 52 cards. The probability that it is spade & it is heart.

$\Rightarrow {}^{52}C_2 = \frac{52 \times 51}{2 \times 1} = 1326 = n(S)$.

${}^{13}C_1 \times {}^{13}C_1 \Rightarrow 13 \times 13 = 169$.

$\frac{n(S)}{n(E)} = \frac{1326}{169} = \frac{442}{5}$

$\frac{n(E)}{n(S)} = \frac{169}{1326} = \frac{13}{102}$

Q. A card is drawn at a random from a pack of 52 cards. What is the probability that the card drawn is called face card.

$\frac{n(E)}{n(S)} = \frac{12}{52} = \frac{3}{13}$.

Q. A bag contain 6 black & 8 white balls. 1 ball is drawn at random what is the probability that the ball drawn is white.

$\frac{8}{14} = \frac{4}{7}$.

Q. A bag contains 6 white & 4 black balls. 2 balls are drawn at random. Find the probability that they are of same colour.

$n(S) = {}^{10}C_2 = \frac{10 \times 9}{2 \times 1} = 45.$

$n(E) = {}^{6}C_2 + {}^{4}C_2 = \frac{6 \times 5 \times 4 \times 3}{2 \times 2} = 90$

$= \frac{6 \times 5}{2} + \frac{4 \times 3}{2} = 15 + 6 = 21$

$\frac{n(E)}{n(S)} = \frac{21}{45} = \frac{7}{15}$