

NCERT: Class XII

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13.4.4 Find the probability distribution of

- (i) number of heads in two tosses of a coin.
- (ii) number of tails in the simultaneous tosses of three coins.
- (iii) number of heads in four tosses of a coin.

Solution:

Variable	Value	Description
n	$\{2, 3, 4\}$	Number of trials in 2,3,4 tosses of a coin
p	$\frac{1}{2}$	Probability of getting a head
q	$1 - p$	Probability of not getting a head
X_1	$\{0, 1, 2\}$	Number of heads in 2 tosses of a coin
X_2	$\{0, 1, 2, 3\}$	Number of tails in 3 tosses of a coin
X_3	$\{0, 1, 2, 3, 4\}$	Number of heads in 4 tosses of a coin

Table 13.4.4.2: Variable Description

\Rightarrow Refer (13.4.4.2) for numericals

(a) Number of heads in two tosses of a coin.

$$p_{X_1}(k) = {}^nC_k p^k q^{n-k}, 0 \leq k \leq 2, n = 2 \quad (13.4.1.1)$$

(b) Number of tails in the simultaneous tosses of three coins.

$$p_{X_2}(k) = {}^nC_k p^k q^{n-k}, 0 \leq k \leq 3, n = 3 \quad (13.4.2.2)$$

(c) Number of heads in four tosses of a coin.

$$p_{X_3}(k) = {}^nC_k p^k q^{n-k}, 0 \leq k \leq 4, n = 4 \quad (13.4.3.3)$$