A1110 Assignment 1
11.16.3.8

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Question: : 8 : Three coins are tossed once. Find the probability of getting:
(i) 3 heads (ii)2 heads (iii) Atleast 2 heads
(iv) Atmost 2 heads (v) No head (vi) 3 tails
(vii) Exactly 2 tails $(viii)$ No tail (ix) Atmost 2 tails
Solution: : Let X be a random variable such that:

$$X := Numberofheads$$

$$X \begin{cases} 0, \\ 1, \\ 2, \\ 3 \end{cases}$$

Let S denote sample space of possible outcomes when the coins are tossed.
Then $\mid S \mid = 2^3 = 8$

(i) $\Pr(X = 3)$ = $\frac{1}{8}$

(ii) $\Pr(X = 2)$ = $\frac{^3C_2}{8} = \frac{3}{8}$

(iii) $\Pr(X \geq 2)$ = $\frac{^3C_3 + ^3C_2}{8} = \frac{4}{8}$

(iv) $\Pr(X \leq 2)$ = $\frac{8 - ^3C_3}{8} = \frac{7}{8}$

(v) $\Pr(X = 0)$ = $\frac{^3C_0}{8} = \frac{1}{8}$

(vi) $\Pr(X = 0)$ = $\frac{^3C_0}{8} = \frac{1}{8} (\because 3tails \equiv 0heads)$

(vii) $\Pr(X = 1)$ = $\frac{^3C_1}{8} = \frac{3}{8} (\because 2tails \equiv 1head)$

(viii) $\Pr(X = 3)$ = $\frac{^3C_3}{8} = \frac{1}{8} (\because 0tails \equiv 3heads)$

(ix) $\Pr(X \geq 1)$ = $\frac{8 - ^3C_0}{8} = \frac{7}{8}$ $(\because atmost2tails \equiv atleast1head)$

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