Assignment

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Question XL 63/2023
n a diploid angiosperm species, flower colour is regulated by the R gene. RR and Rr genotypes produce red flowers, whereas the rr genotype produces white flowers. If two individual plants are randomly selected from a large segregating population of a genetic cross between RR and rr parents, the probability of both the plants producing red flowers is
Solution:
For the parent genes:

	R	R
r	Rr	Rr
r	Rr	Rr

TABLE I
GENE OF PARENTS.

Hence, we can see that it gives only Rr gene
For the children genes:

	R	r
R	RR	Rr
r	Rr	rr

TABLE II
GENE OF CHILDREN.

RV	Values	Description
X	0	RR
	1	Rr
	2	rr

TABLE III
RANDOM VARIBALE DECLARATION

$$\Pr(X = k) = {}^{2}C_{k}\left(\frac{1}{2}\right)^{k}\left(\frac{1}{2}\right)^{2-k} \tag{1}$$

$$= {}^{2}C_{k}\left(\frac{1}{2}\right)^{2} \tag{2}$$

we know that Red flower comes for RR and Rr
Therefore,

$$\Pr(X \leq 1) = 1 - \Pr(X = 2) \tag{3}$$

$$= 1 - \frac{1}{4} \tag{4}$$

$$= \frac{3}{4} \tag{5}$$