

A die is thrown two times and the sum of the scores appearing on the die is observed to be a multiple of 4. Then the conditional probability that the score 4 has appeared at least once is :

(1) $\frac{1}{8}$

(2) $\frac{1}{9}$

(3) $\frac{1}{3}$

(4) $\frac{1}{4}$

$$(2) \frac{1}{9}$$

A : Sum obtained is a multiple of 4.

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

B : Score of 4 has appeared at least once.

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

$$\text{Required probability} = P\left(\frac{B}{A}\right) = \frac{P(A \cap B)}{P(A)}$$

$$= (1/36)/(9/36)$$

$$= 1/9$$