

Assignment1(AI1103)

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1 PROBLEM STATEMENT

A die is thrown again and again until three sixes are obtained. Find the probability of obtaining the third six in the sixth row of a die

2 SOLUTION

Let P be the probability of getting third six in sixth row.

Now, we will solve this question using multiplication rule in probability. Let I be probability in individual trial (of getting 6 or not getting 6). So, if we got 6 then $I = \frac{1}{6}$ and if we did not get 6 then $I = \frac{5}{6}$.

Trial No	1	2	3	4	5	6
I	$\frac{1}{6}$	$\frac{5}{6}$	$\frac{5}{6}$	$\frac{5}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

TABLE 0: Table of probability

So, now using multiplication rule, we can say

$$P = \binom{5}{2} \times \frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} \times \frac{1}{6} \times \frac{1}{6} \times \frac{1}{6} \quad (2.0.1)$$

$$P = \binom{5}{2} \times \left(\frac{5}{6}\right)^3 \times \left(\frac{1}{6}\right)^3 \quad (2.0.2)$$

$$P = 10 \times \left(\frac{5}{6}\right)^3 \times \left(\frac{1}{6}\right)^3 \quad (2.0.3)$$

$$P = \frac{1250}{6^6} \quad (2.0.4)$$

$$\boxed{P = 0.0267} \quad (2.0.5)$$

So, the probability of getting third six in sixth row is 0.0267.