Question:A student says that if you throw a die, it will show up 1 or not 1. Therefore, the probability of getting 1 and the probability of getting 'not 1' each is equal to $\frac{1}{2}$. Is this correct? Give reasons.

Solution:

Given,

A die is thrown

Total number of outcomes = 6

Hence, Probability of getting 1 be $p_X(X=1) = \frac{1}{6}$

Then

$$p_X(2 \le X \le 6) = \frac{5}{6} \tag{1}$$

$$p_X(X=1) = 1 - p_X(2 \le X \le 6) \tag{2}$$

$$= 1 - \frac{5}{6} \tag{3}$$

$$= \frac{1}{6} \tag{4}$$

$$\implies p_X(2 \le X \le 6) \neq p_X(X=1) \tag{5}$$

Since, $p_X(X=1)$ and $p_X(2 \le X \le 6)$ are not equal.

$\therefore$ The given statement is not true