Answer on Question #43890-Math-Statistics and Probability

Using a normal dice, rolled 5 times, the probability of rolling 2 sixes would be 1.61%

i.e 1/6 x 1/6 x 5/6 x 5/6 x 5/6 =125/7776

Using a normal dice, rolled 5 times, the probability of not rolling a six at all would be 40.19%

i.e 5/6 x 5/6 x 5/6 x 5/6 x 5/6 = 3125/7776

Solution

Let's use Bernoulli distribution.

Using a normal dice, rolled 5 times, the probability of rolling 2 sixes would be

$$P(2 \text{ sixes }) = \frac{5!}{(5-2)!\,2!}\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)^{5-2} = \frac{5!}{3!\,2!}\cdot\frac{5^3}{6^5} = 10\cdot\frac{125}{7776} = 0.1607 = 16.07\%,$$

where $n! = 1\cdot 2\cdot 3\cdot \ldots n$, $\frac{1}{6}$ is the probability of rolling sixe rolled 1 time, $\frac{5}{6}$ is the probability of not-rolling sixe rolled 1 time.

Using a normal dice, rolled 5 times, the probability of not rolling a six at all would be

$$P(\text{not rolling a six }) = \frac{5!}{(5-0)!\,0!}\left(\frac{1}{6}\right)^0\left(\frac{5}{6}\right)^{5-0} = \frac{5!}{5!\,0!}\cdot\left(\frac{5}{6}\right)^5 = 1\cdot\frac{3125}{7776} = 0.4019 = 40.19\%.$$