## Answer on Question \#43165-Math-Statistics and Probability

In a package of M\&Ms there are 20 pieces. The pieces come in 6 different colors: red, blue, green, yellow, orange and brown. Assuming that the $M \& M$ colors occur with equal probability, what is the probability of getting 5 green $\mathrm{M} \& \mathrm{Ms}$ in a package, using binomial distribution?

## Solution

In a package of $M \& M s$ there are $n=20$ pieces.

Assuming that the $\mathrm{M} \& \mathrm{M}$ colors occur with equal probability, the probability of getting green $\mathrm{M} \& \mathrm{Ms}$ in a package is $p=\frac{1}{6}$.

The probability of getting 5 green $\mathrm{M} \& \mathrm{Ms}$ in a package is

$$
\operatorname{Pr}(X=5)=\binom{20}{5}\left(\frac{1}{6}\right)^{5}\left(1-\frac{1}{6}\right)^{20-5}
$$

where

$$
\begin{gathered}
\binom{20}{5}=\frac{20!}{(20-5)!5!}=15504 . \\
\operatorname{Pr}(X=5)=15504\left(\frac{1}{6}\right)^{5}\left(\frac{5}{6}\right)^{15}=0.13 .
\end{gathered}
$$

Answer: 0.13

