Probability: Binomial Probability

1. For n repeated rials, with constant probability of success p for all trials, find the probability of exactly x successes.

   (a) $n = 5, p = \frac{1}{3}, x = 4 {}_5C_4 \left(\frac{1}{3}\right)^4 \left(\frac{2}{3}\right) = \frac{10}{3^5}$

   (b) $n = 10, p = .9, x = 6 {}_{10}C_6 \left(.9\right)^6 \left(.4\right)^4 = \frac{9^7}{10^9}$

   (c) $n = 20, p = \frac{1}{8}, x = 5 {}_{20}C_5 \left(\frac{1}{8}\right)^5 \left(\frac{7}{8}\right)^{15} =$

   (d) $n = 10, p = .3x = 2 {}_{10}C_2 \left(.3\right)^2 \left(.7\right)^8 =$

2. Manny has a .320 batting average, meaning he hits the ball with success rate $p = .32$. In a game against a rival team he will bat 10 times. Find the probability he will get more than two hits in the series. $1 - {}_{10}C_2 \left(.32\right)^2 \left(.68\right)^8 - {}_{10}C_1 \left(.32\right) \left(.68\right)^9 - \left(.68\right)^{10}$

3. Benji Roberts is taking a ten question multiple choice test of which each question has three answer choices, only one of which is correct. Benji decides on answers by rolling a fair die and marking the first answer choice if he rolls a 1 or 4, the second if he rolls a 2 or 5, and the third if he rolls a 3 or 6. Find the probability of the following events.

   (a) He marks exactly 3 correct answers.2601

   (b) He marks less than 3 correct answers.2991

   (c) He marks atleast 7 correct answers

   (d) He marks 10 correct answers $\frac{1}{3^{10}}$

4. During a presidential campaign, 58% of the political columns in a group of major newspapers were favorable to the incumbent president. If a sample of 10 of these columns is selected at random, what is the probability that none of them will be favorable to the incumbent president?.0001708