

1. Suppose $X \sim \text{binomial}(K = 10, p = \frac{2}{5})$. What is the expected value of $3X - 4$?
2. Suppose $U \sim U(0, 1)$. Let $Y = (b - a)U + a$. Calculate the expected value of Y .
3. If Y denote a temperature recorded in degrees Fahrenheit, then $\frac{5}{9}(Y - 32)$ is the corresponding temperature in degrees Celsius. Assume the standard deviation for a data set of temperatures is $15.7^\circ F$. What is the standard deviation in Celsius?
4. It is believed that approximately 65% of American under the age of 65 have private health insurance. Let X equal the number of Americans under the age of 65 in a random sample of $k = 15$ that have private health insurance.
 - How is X distributed?
 - Give the mean, variance, and standard deviation of X .
 - Find the probability that exactly 10 have private health insurance.
 - Find the probability that at most 10 have private health insurance.
 - Find the probability that at least 10 have private health insurance.