Combining means, variances, and standard deviations

1. Let X be the value on a rolled die. We've previously computed the mean and variance of this random variable as

$$\mu_X = \frac{7}{2} \qquad \text{and} \qquad \sigma_X^2 = \frac{35}{12}$$

   Consider the random variable with values given by the sum on five dice rolled independently. Determine the mean, variance, and standard deviation for this random variable.

2. Think of a coin as a "two-sided die" by assigning the value 0 to tails and 1 to heads. Roll a die and flip a coin and then sum the two values to get the value of a random variable. Determine the mean, variance, and standard deviation for this random variable. Note that you'll need to work out the mean and variance for the random variable that is the value given by the coin flip.

3. The average body height of women age 20-29 years can be approximated as a normally distributed random variable with mean 64.0 inches and standard deviation 2.7 inches. Now consider adding the heel height of shoes to get a total height when wearing shoes. Suppose heel heights have a mean of 1.1 inch and a standard deviation of 0.4 inches. Find the mean and standard deviation of total height assuming that body height and heel height are independent variables. Also, give some argument for why this assumption of independence *might not* be appropriate.