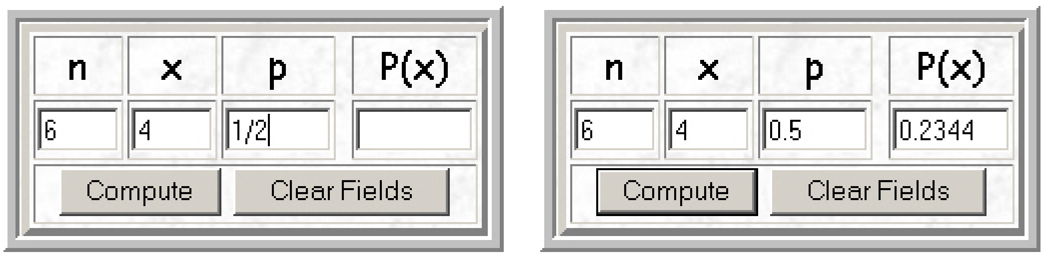
SOLUTIONS - CHAPTER 9 EXERCISES

9.1 This is a binomial experiment with our random variable, *X*, denoting the number of tails tossed. We have $n = 6, p = \frac{1}{2}$, and $x = 4$. So,

$$\begin{aligned} P(X = 4) &= C(6,4)\left(\tfrac{1}{2}\right)^4\left(\tfrac{1}{2}\right)^{6-4} \\ &= \tfrac{15}{64} \\ &\approx 0.2344 \end{aligned}$$

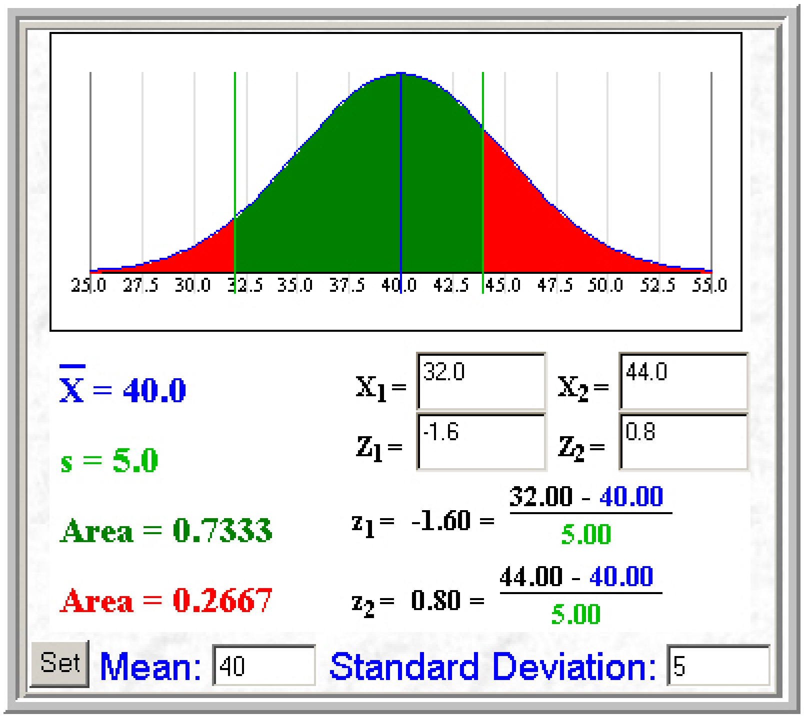
Binomial Probability Calculator



9.3 *X* may take values in the set $\{1,2,\ldots\} = \{\text{All positive integers}\}$ because you may draw a white jellybean on the first draw or you may just have to keep on drawing. There is no upper limit on the number of times you draw since the jellybeans are continually replaced into the jar.

9.5 We are looking for $P(32 \le X \le 44)$, where *X* is a normal random variable. This means we are looking for the area under the normal curve with $\mu = 40$ and $\sigma = 5$ from $X = 32$ to $X = 44$.

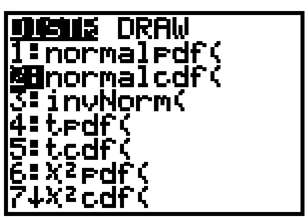
Applet Method First, set the mean at 40 and the standard deviation at 5. Then, set $X_1 = 32$ and $X_2 = 44$.

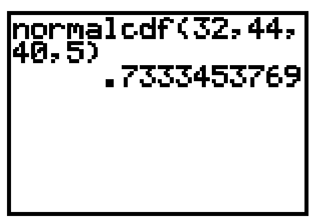


The green area gives our probability and therefore $P(32 \le X \le 44) = 0.7333$.

Calculator Method (TI-83) Use the built-in **normalcdf** function under **[2nd][VARS]**. The format for the function is the following:

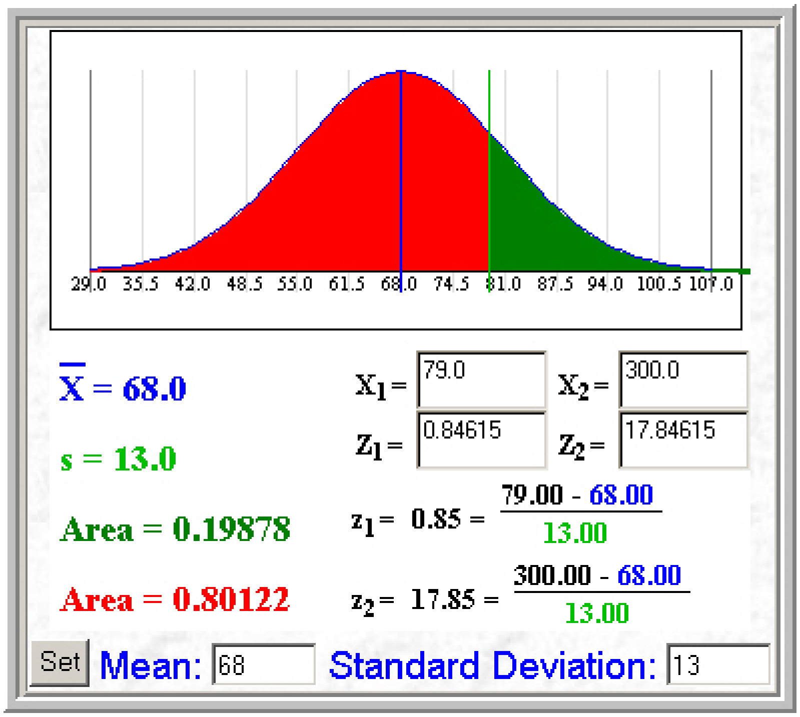
$$normalcdf\left(X_1, X_2, \mu, \sigma\right)$$





Thus, we have $P(32 \le X \le 44) \approx 0.7333$.

9.7 Applet Method First, set the mean at 68 and the standard deviation at 13. Since the possible cutoffs are given, use the applet to "guess and check" to find the cutoff which has the area above it at 0.20, representing the 20% of the students who make A's and B's.



In doing so, the cutoff that comes the closest is 79, as shown above.

9.9 If X is the binomial random variable for the number of broken candles, we would look for the probability, $P(40 < X \leq 200)$. In other words, we would find and add the areas of the rectangles at $X = 41, 42, \ldots 200$ in the histogram of the binomial distribution. When the normal curve is superimposed over this binomial distribution (histogram), this means our left endpoint will be at 40.5 and our right endpoint will be at infinity since the normal curve goes to infinity.