From the tables of the standard normal distribution, we see that the value z such that $\Phi(z) = 0.998$ is $z = 2.05$. Since Φ is a one-to-one function (as it is strictly increasing), we deduce that we must have

$$\frac{1.6 - \mu}{0.02} = 2.05.$$

Upon solving this, we obtain $\mu = 1.6 - (0.02)(2.05) = 1.559$, which is the desired result.

We have mentioned earlier in this section that the normal distribution offers a satisfactory approximation to the binomial distribution. Figure 7.7 depicts the probability function of the binomial distribution when $p = 0.6$ and $n = 1, 2, 5, 10, 25, 100$.

It is apparent that as n increases, the shape of the probability function resembles that of a normal distribution. Figure 7.8 shows, on the same graph, the binomial probability function

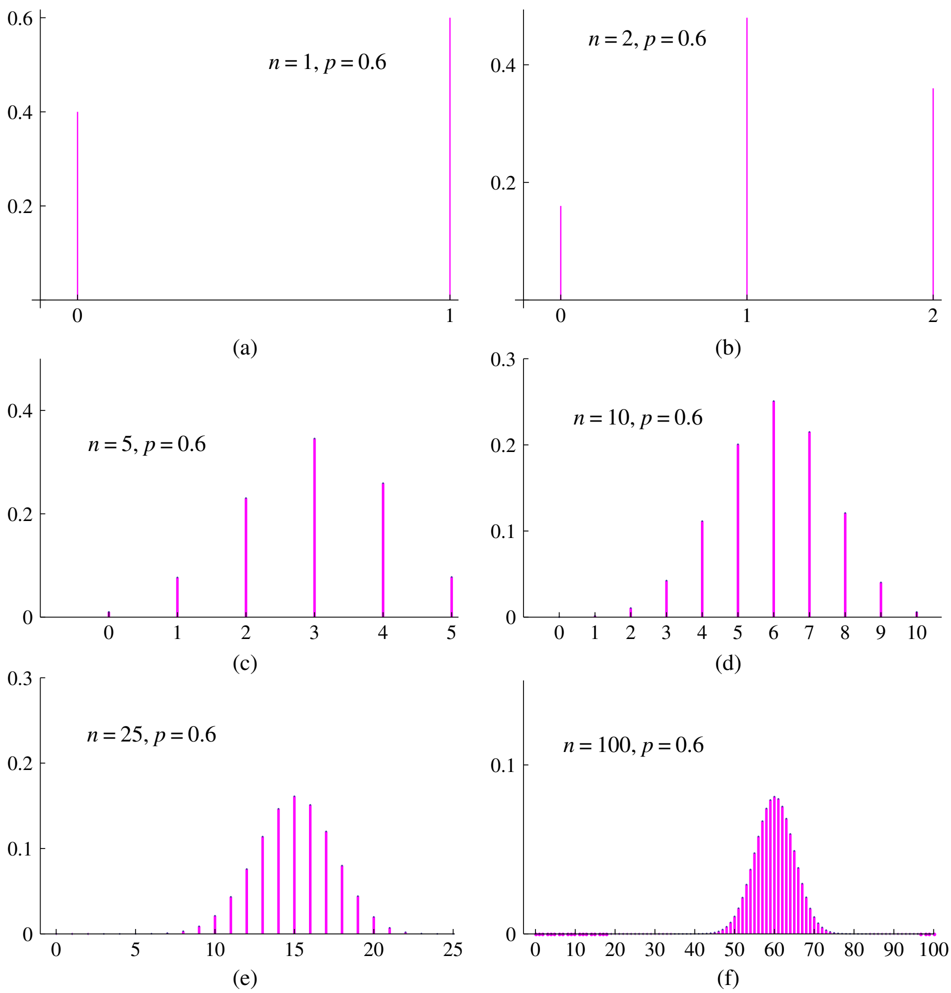

Figure 7.7 The probability function of the binomial distribution function for $p = 0.6$ and various values of n.