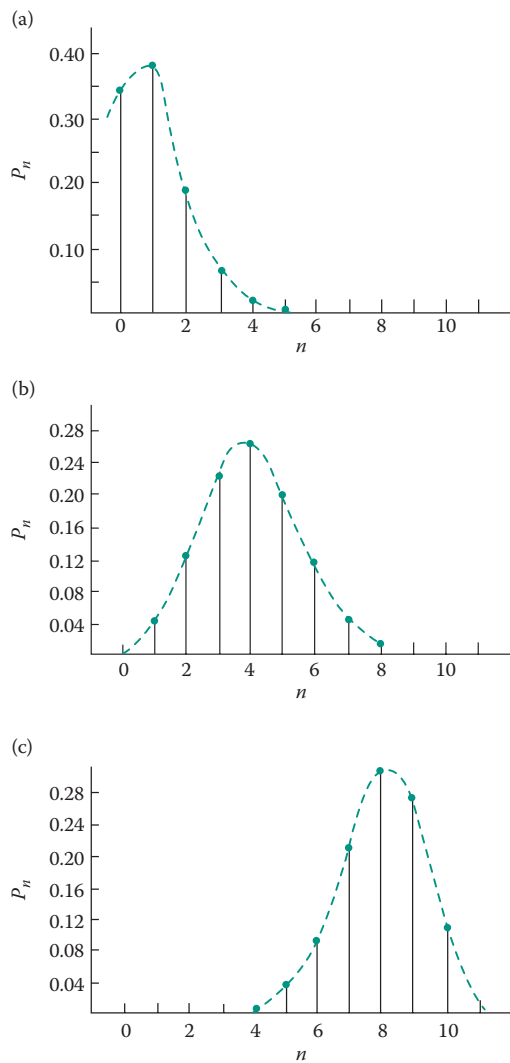
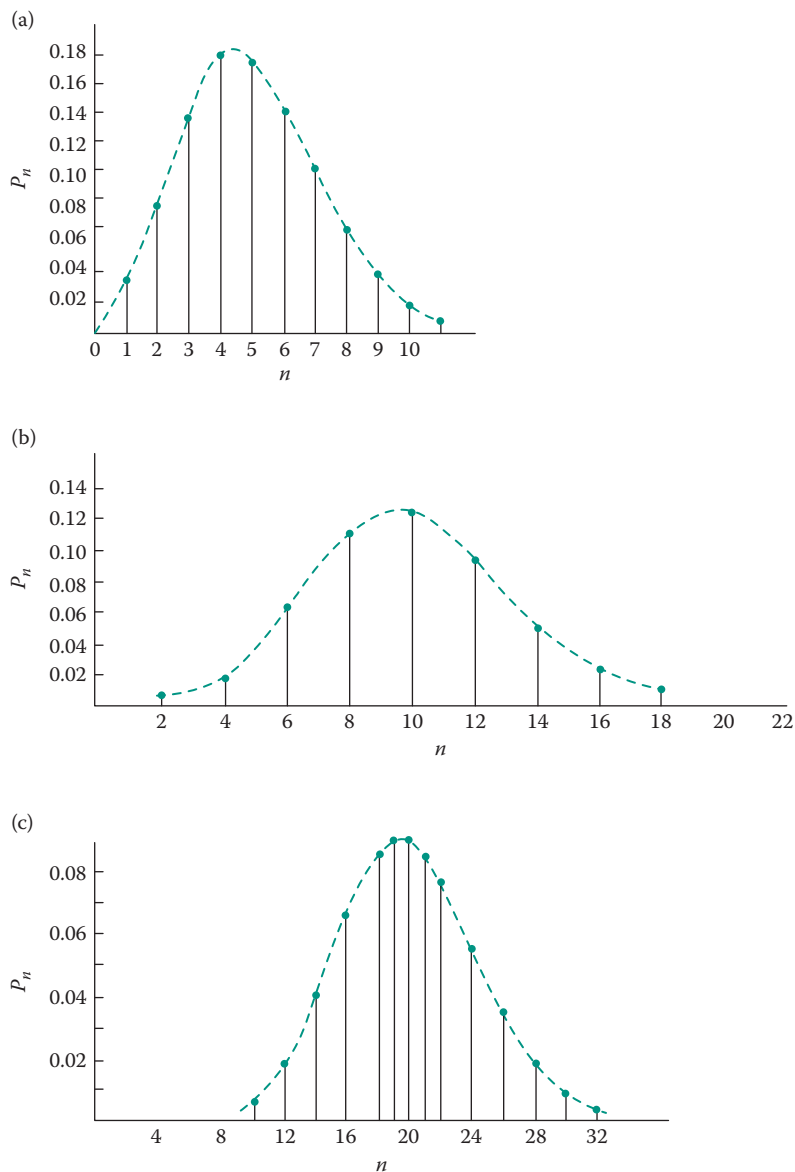


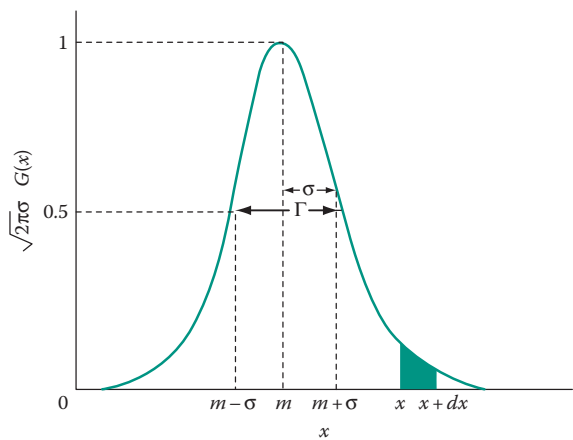
**FIGURE 2.1** The mode ( $x_1$ ), the median ( $x_2$ ), and the mean ( $m$ ) for a continuous probability distribution function.



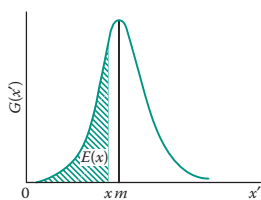
**FIGURE 2.2** Three binomial distributions with  $N = 10$  and (a)  $p = 0.1$ , (b)  $p = 0.4$ , and (c)  $p = 0.8$ .



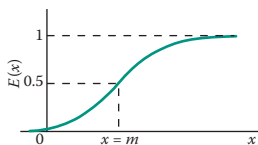
**FIGURE 2.3** Three Poisson distributions: (a)  $m = 5$ , (b)  $m = 10$ , and (c)  $m = 20$ .



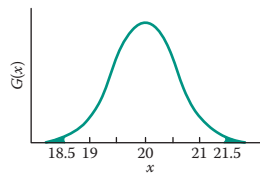
**FIGURE 2.4** A normal (Gaussian) distribution.



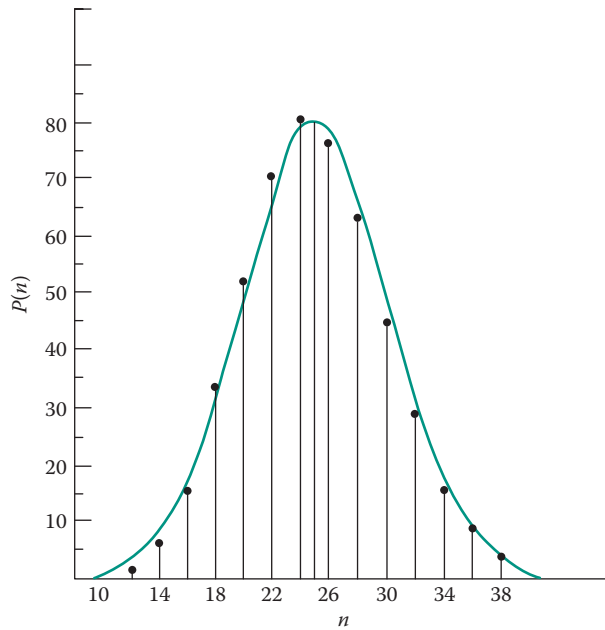
**FIGURE 2.5** The cumulative normal distribution is equal to the shaded area under the Gaussian curve.



**FIGURE 2.6** The error function.

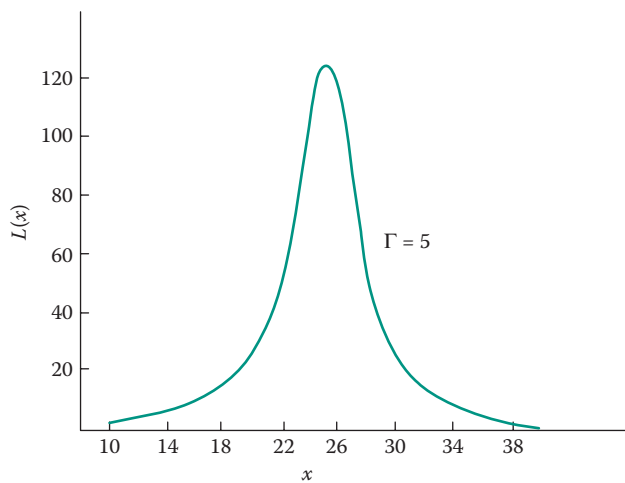


**FIGURE 2.7** The shaded areas represent the fraction of defective rods, [Example 2.12](#).

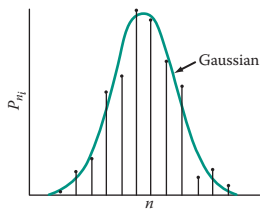


**FIGURE 2.8** Comparison between a Poisson distribution with  $m = 25$  and a Gaussian distribution with the same average and standard deviation  $\sigma = \sqrt{m} = 5$ .

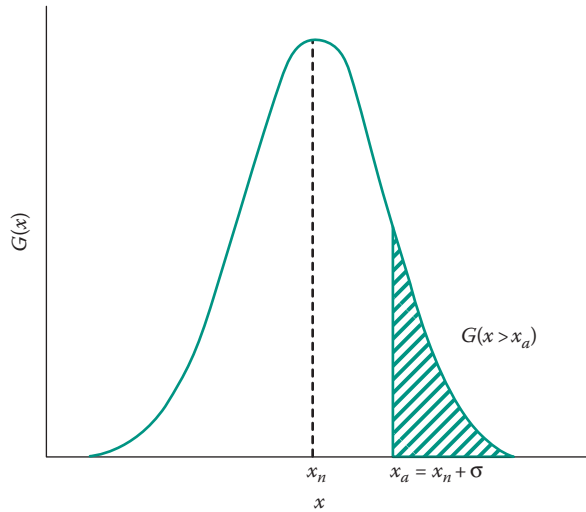




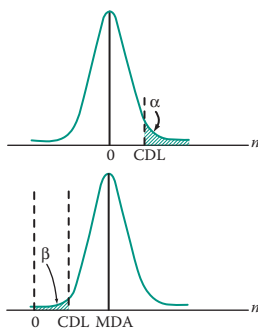
**FIGURE 2.9** A Lorentzian distribution peaking at  $x = 25$  and having an FWHM equal to 5.



**FIGURE 2.10** The distribution of the frequency of occurrence of individual results of a series of identical measurements tends to follow a Gaussian distribution.



**FIGURE 2.11** The probability that  $x$  will exceed  $x_a$ , where  $x_a = x_n + \sigma$ , is 15.9% (shaded area). The confidence limit is  $1 - 0.159$ , or 84.1%.



**FIGURE 2.12** The meaning of the critical detection limit (CDL) and minimum detectable activity (MDA) in terms of the confidence limits defined by  $\alpha$  and  $\beta$ .