

EXAMPLE 3-7. Consider a binomial distribution with  $n = 8$  and  $p = \frac{1}{2}$ . The actual distribution function is

$$P(X \leq x) = \sum_{k \leq x} \binom{8}{k} \left(\frac{1}{2}\right)^k \left(\frac{1}{2}\right)^{n-k},$$

and the normal approximation is

$$P(X \leq x) \doteq \Phi\left(\frac{x-4}{\sqrt{2}}\right).$$

The graphs of these two functions are shown in Figure 3-1.

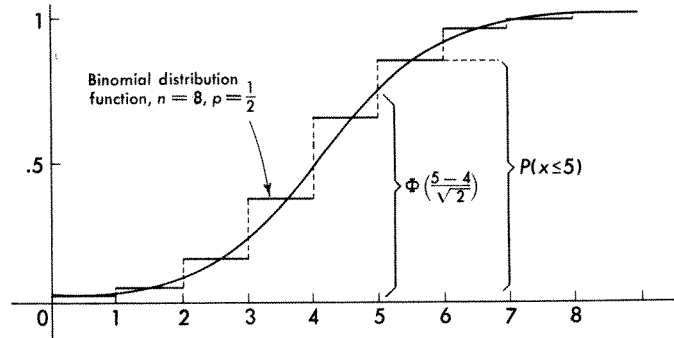


Figure 3-1

Lindgren (1976): Statistical Theory,  
3. laitos, s. 173.

Parempi approksimaatio on

$$P(X \leq x) \doteq \Phi\left(\frac{x + \frac{1}{2} - 4}{\sqrt{2}}\right)$$

Yleinen tilanne:

$$P(X \leq k) \doteq \Phi\left(\frac{k + \frac{1}{2} - np}{\sqrt{npq}}\right).$$