

9.3 Erlang C Curves

We have provided you with two sets of curves in Figure 9.3 and 9.4. In an exam, if they are needed, curves will be provided with the exam paper. Make sure you mark the curves and hand them in with your paper. To illustrate the use of the curves we will consider a simple telephone trunking example and a customer service centre example, see Examples 2 and 3 at the end of this chapter.

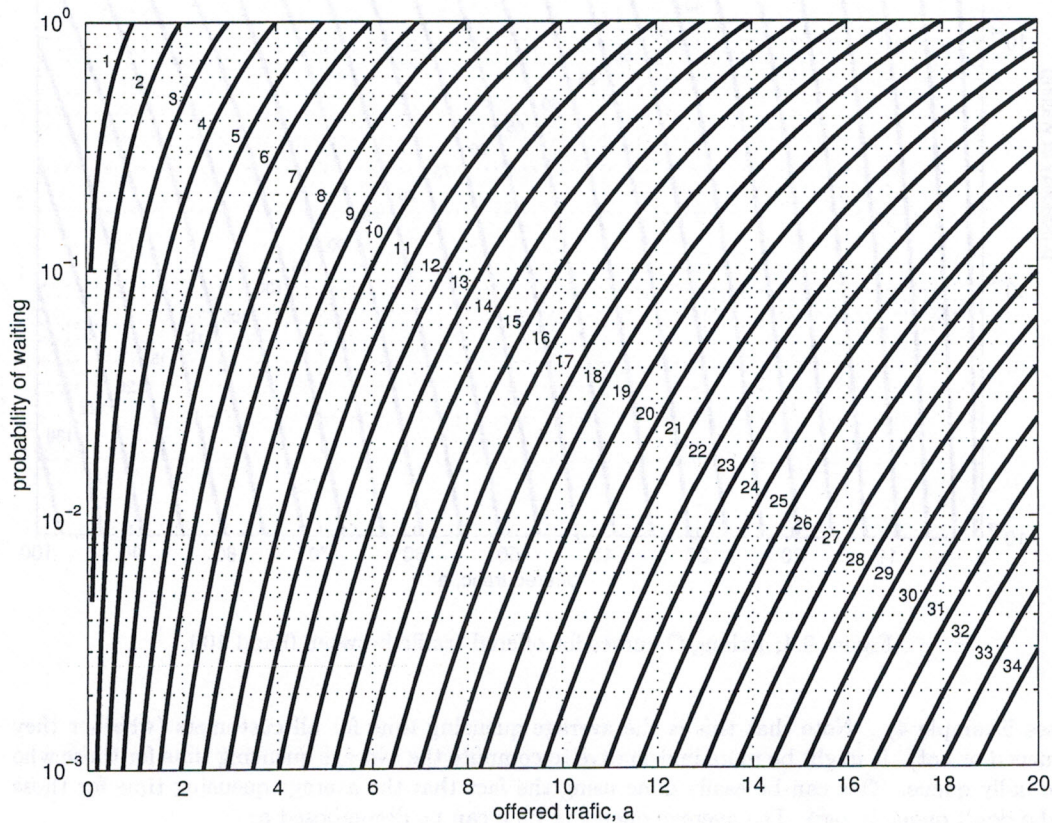


Figure 9.3: Erlang C curves for offered traffic between 0 and 20.

9.3.1 Average number in System.

By computing the expectation of k under the stationary distribution, we can also compute the average number of calls in the Erlang Delay System. The result of this computation is:

$$\bar{N} = \frac{\rho}{1-\rho} C(m, a) + m\rho.$$

These terms represent the average queue length and the average number of busy lines. The average queue length is given by

$$\bar{N}_Q = \frac{\rho}{1-\rho} C(m, a)$$

so using Little's formula the average queueing time is simply

$$\bar{W} = \frac{\bar{N}_Q}{\lambda} = \frac{C(m, a)}{m\mu(1-\rho)}.$$