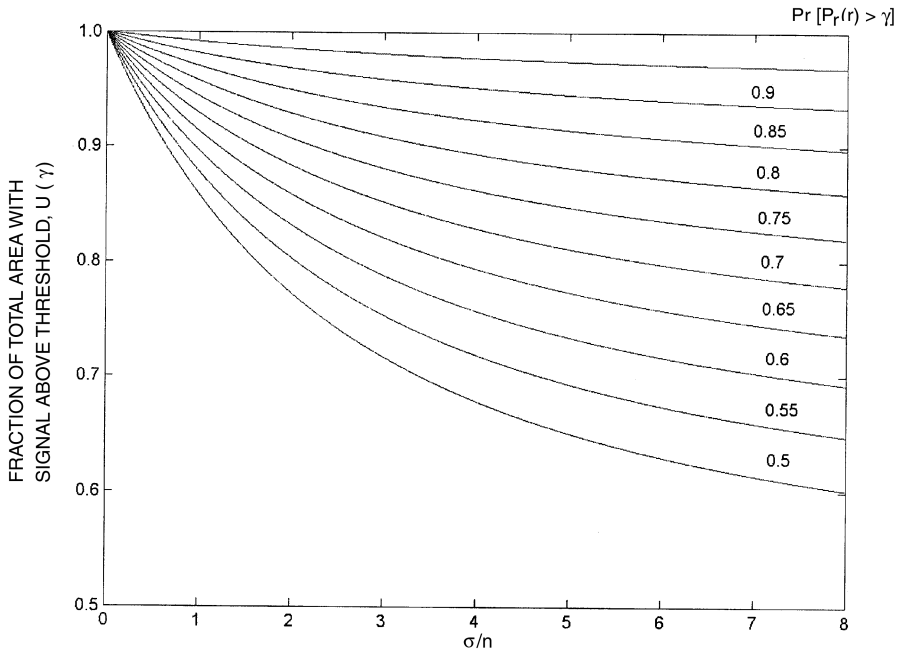

Figure 4.18 Family of curves relating fraction of total area with signal above threshold, $U(\gamma)$ as a function of probability of signal above threshold on the cell boundary.

Example 4.9

Four received power measurements were taken at distances of 100 m, 200 m, 1 km, and 3 km from a transmitter. These measured values are given in the following table. It is assumed that the path loss for these measurements follows the model in Equation (4.69.a), where d_0 = 100 m: (a) find the minimum mean square error (MMSE) estimate for the path loss exponent, n; (b) calculate the standard deviation about the mean value; (c) estimate the received power at d = 2 km using the resulting model; (d) predict the likelihood that the received signal level at 2 km will be greater than -60 dBm; and (e) predict the percentage of area within a 2 km radius cell that receives signals greater than –60 dBm, given the result in (d).

Distance from Transmitter	Received Power
100 m	0 dBm
200 m	–20 dBm
1000 m	–35 dBm
3000 m	–70 dBm