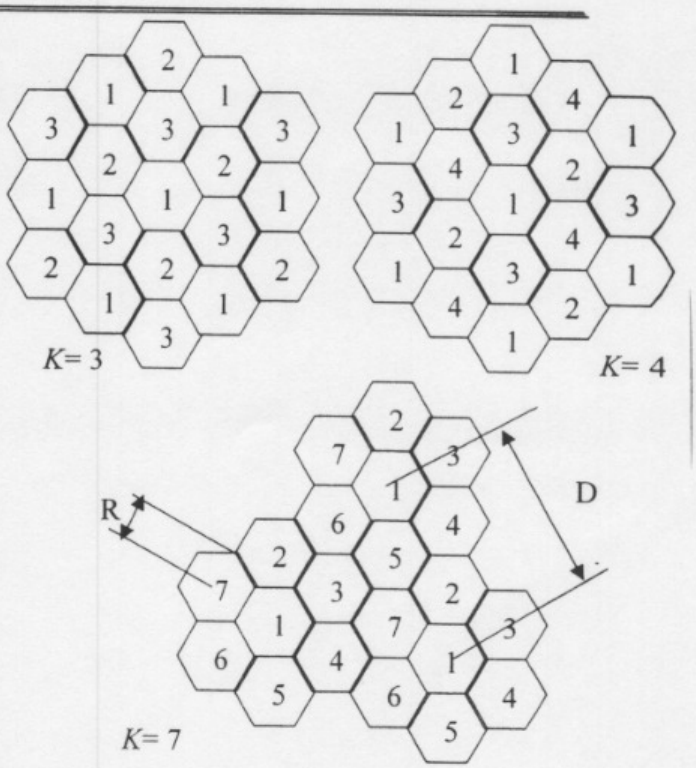
Frequency reuse patterns

SOURCE: [2]

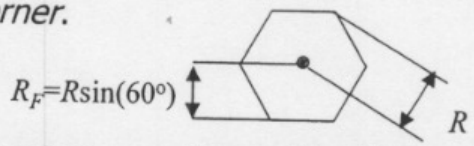
- Reuse allows a small set of frequencies, K to service a large area (numbers refer to transmitters with same frequencies)
- Reuse patterns are designed to minimize *co-channel interference* (interference from other base stations using the same frequency)
- a larger reuse pattern (e.g. K=7) results in a larger distance between base stations that use the same frequency $D=\sqrt{3K}R$



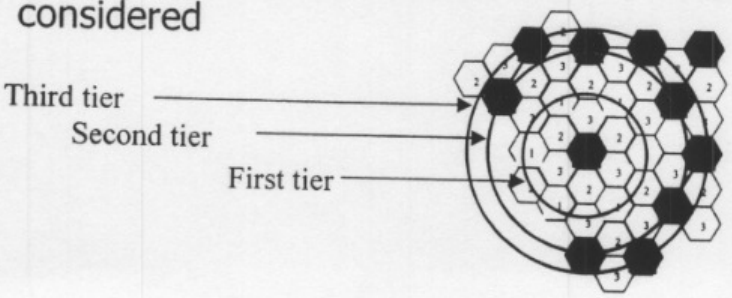
- We define the the co-channel interference reduction factor by

$$q=\frac{D}{R}=\sqrt{3K}$$

  - Note that the radius R, is the distance from the centre of the cell (base station) to an outer *corner*.



  - The distance D, is the distance from one transmitter(base station, or centre of the cell) to the next transmitter of the same frequency.
- In most cases, only the first tier of interfering cells are considered



CLEARLY, THE TRANSMIT POWERS MUST ALSO BE CONTROLLED CAREFULLY