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Student Info

Example:

* An area of (14x15) km having (1050) comm. channels, determine the following:
  1- The number of users before cellular concept application.
  2- Using cells each of 2 km^2, then determine the number of frequency reuse if we use cluster size = 3 cells and then the number of users.
  3- repeat (2) if the cluster size = 7 cells.
  4- comment on the results in (1), (2) & (3).

Sol^n

(1) # users | before Cellular system = # channels = 1050 users
So (1 channel for each user)

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(2) # cells = tot area / cell area = 14*15 / 2 = 105 cells

clusters = # cells / # Cells in 1 cluster = # cells / cluster size = 105 / 3 = 35 cluster

∴ # freq reuses = # clusters = 35 freq reuses

users | cluster size = # channels * # freq reuses

= # users/cluster * # Clusters

= 1050 * 35 = 36750 users

③ Same num of Cells = 105 cells

→ # Clusters = $\frac{105}{7}$ = 15 Clusters = # freq reuses

→ # users = 1050 * 15 = 15750 users

@ 7 cluster size

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④ Comment :

* according to :

# users	Co-channel Interference
• best case is No. 2 using cellular system • best cluster size = 3 Cells (but it is the worest in interference)	• best Case is No. 1 before cellular system but it is the worst in # users • best case using the cellular system is No. 3 (but it is worse in # users than No. 2)

* Trade off between :

# users	Co-channel Interference
To acheive more # of users we need less cluster size ↓	* to acheive min interference we need Larger Cluster Sizes ↑

* Conclusion :

The Smaller the cluster size ↓, the Larger the Cell Capacity ↑

; the more allowable # of users ↑ in the Whole area of all Clusters

; but the higher the Co-Channel interference ↑.