

➤

Six friends go on holiday and share twin rooms. Anne doesn't want to share with Betty; Catherine doesn't want to share with Anne or Dianne; Dianne and Elizabeth don't want to share; and Frances won't share with Catherine or Betty.

How could they work out where they will sleep?

How many different sleeping arrangements are there?



It helps to get a summary of who will share with whom first and tabulate it:

Anne	D, E, F
Betty	C, D, E
Catherine	B, E
Dianne	A, B, F
Elizabeth	A, B, C, F
Frances	A, D, E

This can be done by considering Catherine first as she has the least number of options available.

If Catherine shares with Betty then

Anne could share with Dianne
 Elizabeth could share with Frances
 1st solution: A-D, B-C, E-F

Anne could share with Elizabeth
 Dianne could share with Frances
 2nd solution: A-E, B-C, D-F

Anne could share with Frances
 Dianne and Elizabeth do not want to share so this is not a solution.

If Catherine shares with Elizabeth then

Anne could share with Dianne
 Frances and Betty do not want to share so this is not a solution.

Anne could share with Frances

Betty could share with Dianne

3rd solution: A-F, B-D, C-E

There are 3 solutions

A-D, B-C, E-F

A-E, B-C, D-F

A-F, B-D, C-E