1. Find the number of elements in $A_1 \cup A_2 \cup A_3$ if there are 100 elements in each set and 50 elements in each of $A_1 \cap A_2$, $A_2 \cap A_3$ and $A_1 \cap A_3$, and none in all three sets

2. Find the numbes of integrs from 1 to 100 that are either odd or a square.

3. Find the number of ~~integer~~ solutions to $x_1 + x_2 + x_3 = 15$ where $0 \leq x_1, x_2, x_3 \leq 6$ are integers.

4. An integer is squarefree if it is not divisible by any perfect square greater than 1. Find the number of squarefree positive integers less than 100.

. List all the derangements of $\{1, 2, 3, 4\}$.

. Prove the pinciple of inclusion-exclusion using mathematical induction.