Inclusion-Exclusion Principle Homework
for Janet Vassilev's Math 327 course

1. In a group of 20 pizza experts, 15 like pepperoni and 12 like sausage and 10 like both.
   (a) How many like at least one topping?
   (b) How many like pepperoni but not sausage?
   (c) How many like exactly one of the two toppings?
   (d) How many like neither of the toppings?
2. How many numbers between 1 and 200 are divisible by 3, 5 or 7?
3. How many integers less than 250 are relatively prime to 250?
4. Suppose U is a set with 75 elements. A_1, A_2, A_3 and A_4 are subsets of U with the following properties:
   - Each subset contains 28 elements.
   - The intersection of any two subsets contains 12 elements.
   - The intersection of any three subsets contains 5 elements.
   - The intersection of all four contains 1 element.

   Find the number of elements that belong to none of the four subsets.