

Math 5c, homework 12.



1.  $A = \{1, 2, 5, 10, 15, 20\}$

$B = \{2, 5, 10, 25, 45, 70\}$

Write the sets  $C = A \cup B$  and  $D = A \cap B$

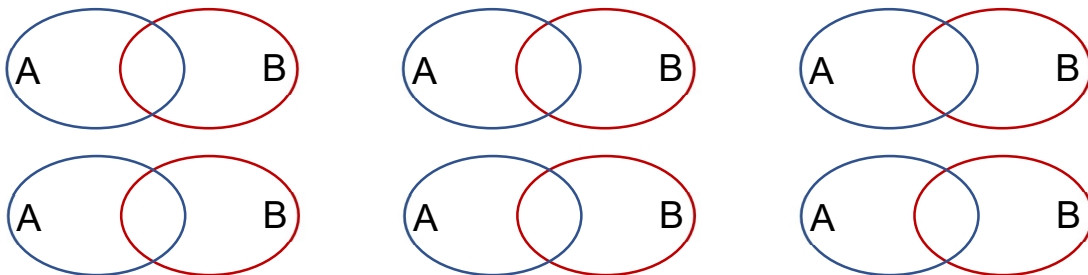
2.  $A = \{1, 2, 5, 10, 15, 20\}$

$B = \{2, 5, 10, 20, 25, 45, 70\}$

$C = \{2, 5, 15, 20, 25, 65, 75\}$

Write the sets  $M = A \cap B \cap C$ ,  $N = (A \cap B) \cup C$

3. On the diagrams of sets A, and B put 4 elements so that (just draw 4 points, or put any four letters).
- each set contains 3 elements
  - set A contains 2 elements, set B contains 4,
  - set A contains 4 elements, sets B contains 3 elements,
  - set A contains 0 elements, set B contains 4 elements,
  - each set contains 2 elements,
  - each set contains 4 elements.



4. Students who participated in math competition had to solve 2 problems, one in algebra and another in geometry. Among 100 students 65 solved algebra problem, 45 solved geometry problem, 20 students solved both problems. How many students didn't solve any problem at all?
5. A farmer has a cow, a goat, and a goose. The cow and the goat together can eat all the grass on his meadow in 45 days, the cow and the goose can eat all the grass on the same meadow in 60 days, and the goat and the goose can eat all the grass on the meadow in 90 days. How many days will it take all three of them together to eat all the grass on the meadow? (Assuming that new grass is not growing).

6. Prove, that

a.  $(m - n)(m^2 + mn + n^2) = m^3 - n^3$

b.  $(m + n)(m^2 - mn + n^2) = m^3 - n^3$

7. Each phone number has 10 digits: (NXX) NXX-XXXX. How many different phone numbers may be created in the US? The area code (first three digits of the number) and the number itself can't start with 0 or 1. (N can be 2-9 and X can be 0-9)