1. Among 130 students, 60 study mathematics, 51 physics and 30 both

mathematics and physics. Of the 54 students studying chemistry, 26 study mathematics, 21 physics and 12 both mathematics and physics. All students studying neither mathematics nor physics are studying biology.

* 1. How many students are studying biology?
  2. How many students not studying chemistry are studying mathematics but not physics?
  3. How many students are not studying mathematics. Physics or chemistry?

1. Consider the set of integers from 1 to 250. Find how many of these numbers are divisible by 3 or 5 or 7? How many are divisible by 3 or 7 but not by 5?
2. A survey on a sample of 25 new cars being sold at a local auto dealer was conducted to see which of three popular options, air conditioning (A), radio (R), and power windows (W) , were already installed. The survey found
   1. 15 had A
   2. 12 had R
   3. 11 had W
   4. 5 had A and W
   5. 9 had R and W
   6. 4 had R and W
   7. 3 had all three options

Find the number of cars that had (a) only W (b) only A, (c) only R, (d) R and W but not A (e) A and R but nor W (f) only one of the option (g) at least one option, (k) None of the option.

1. How many onto functions are there from a set with 6 elements to the set with 3 elements.
2. In a construction site George is in charge of hiring skilled workers. Out of 80 candidates he interviewed he found that

45 were painters

50 were electricians

50 were plumbers

15 had skilled in all three areas

If he has hired those who are skilled in at least two areas. How many workers he hired?

1. 50 number of students appeared for both the examinations. If number of students who got grade A in first examination is equal to that of in second examination. If the total number of students who got Grade in exactly one examination is 40, and 4 students did not get grade A in either examination, determine the number of students who got grade A in first exam only, who got Grade A in second exam only and who got grade in both exams?
2. How many onto functions are there from a set with 6 elements to a set with 3 elements.
3. How many solutions does the equation have where are non- negative integers less than 6.

Mathematical Induction

1. Prove that 2n > n for all positive integers n.
2. Show that 102n-1 + 1 is divisible by 11 for all natural numbers.
3. Find a formula for the sum of first n even positive integers and prove the formula.
4. Find the formula for and prove the formula.
5. Prove that
6. Prove that a set with n elements has subsets containing exactly 3 elements whenever