Pigeonhole Principle

1. If 5 points are to be chosen in an equilateral triangle of side one unit then show that there are atleast 2 points at a distant less than half unit .

2. If 10 points are to be chosen in an equilateral triangle of side 3 units then show that there are atleast 2 points at a distant less than one unit.

3. If 7 points are to be chosen in a regular hexagon of side one unit then show that there are atleast 2 points at a distant less than one unit .

4. If 5 points are to be chosen in a square of side 2 units then show that there are atleast 2 points at a distant less than √2 units .

5. If 7 positive integers with distinct unit places are chosen then show that there are 2 positive integers whose sum is divisible by 10.

6. If 101 integers are chosen from integers 1 to 200 , then show that there are 2 integers such that one divides other.

7. If 11 integers are chosen from integers 1 to 20 , then show that there are 2 integers such that one divides other.

8. If 51 integers are chosen from integers 1 to 100 , then show that there are 2 integers such that one divides other.

9. In a group of 6 persons in which any 2 persons are either friends or enemies, then show that there are 3 persons who are either mutual friends or mutually enemies.

10. If n+1integers are chosen from first 2n integers, then show that there are 2 integers with greatest common divisor 1