

SETS AND COUNTING

1. Which of the expressions below is the same as $(A \cup B)^C$?

- (a) $A \cap B$ (b) $A^C \cap B$ (c) $A^C \cup B$ (d) $A \cup B^C$ (e) $A^C \cap B^C$ (f) $A^C \cup B^C$

2. Shade the region $A \cap (B^C \cup C)$

3. A survey of 100 off-campus college students revealed that in their apartments 40 had only cockroaches and silverfish, 30 had ants and 12 had only silverfish. Also, 18 had cockroaches and ants, 4 had ants and silverfish, two had all three of these pests and 10 had none of these pests. Show this information in a Venn diagram.

4. Find the number of possible 4-digit ID numbers where 0 can't be used as the first digit and all four digits cannot be the same (for example, 1111 is not allowed)

5. How many ways can 3 boys and 2 girls be seated in a row if a boy must sit at both ends of the row?

6. How many different 5 card hands are possible from a standard deck of 52 cards if exactly 3 of the cards are spades?

7. How many different arrangements are there of the letters in the word "statistics"?

8. A box contains 3 red, 4 green and one black jelly beans. In how many ways can a sample of 2 be selected from this box where all are the same color?

9. A recent survey of 110 shoppers at the supermarket found that 70 bought bread, 55 bought meat and 95 bought bread or meat. How many shoppers bought

- a) only meat
- b) neither of these items

10. A committee of 4 is to be chosen from a group of 5 women and 6 men. How many ways can a committee be chosen if there are at least two women on the committee?

11. Find the number of ways that a delegation can be chosen where the president and vice-president are chosen from a group of 10 seniors and the remaining 4 members of the delegation are chosen from a group of 20 juniors and sophomores.

12. How many ways can 5 blue and 8 pink marbles be arranged so that no blue marbles are next to each other?

13. How many ways can 6 people sit around a round table?