CLASS XI – MATHEMATICS – CHAPTER 01
SETS

Name: Date:

Q01. Describe the set in Roster form {x : x is a two digit number such that the sum of its digit is 8}

Q02. Are the following pair of sets equal? Give reasons.

A = {x : x is a letter in the word FOLLOW}   B = {y : y is a letter in the word WOLF}

Q03. Write down all the subsets of the set {1,2,3}

Q04. Let A = {1,2,{3,4,},5} is {{3,4 }} ⇐ A is incorrect. Give reason.

Q05. Draw Venn diagram for (A ∩ B)'

Q06. Write the set in roster form A = The set of all letters in the word T R I G N O M E T R Y

Q07. At the following pair of sets equal? Give reasons

A, the set of letters in "ALLOY" and B, the set of letters in "LOYAL".

Q08. Write down the power set of A,   A = {1, 2, 3}

Q09. A = {1, 2, {3, 4}, 5} which is incorrect and why. (i) {3, 4} ⊂ A (ii) {3, 4} ∈A

Q10. Fill in the blanks.

(i) A ∪ A ' = _____   (ii) (A')' = _____   (iii) A ∩ A' = _____

Q11. Write the set $\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6}, \frac{6}{7}\}$ in the set builder form.

Q12. Is set C = {x:x − 5 = 0} and E = {x:x is an integral positive root of the equation $x^2 -2x - 15 = 0$}

Q13. Write down all possible proper subsets of the set {1, {2}}.

Q14. State whether each of the following statement is true or false.

(i) {2, 3, 4, 5} and {3, 6} are disjoint   (ii) {2, 6, 10} and {3, 7, 11} are disjoint sets

Q15. Fill in the blanks

(i) (A ∪ B)´ = _____   (ii) (A ∩ B)' = _____

Q16. Write the set of all vowels in the English alphabet which precede k.

Q17. Is pair of sets equal? Give reasons. A = {2, 3} B = x : x is solution of $x^2 + 5x + 6 = 0$}

Q18. Write the following intervals in set builder form: (-3, 0) and [6, 12]

Q19. If X = {a, b, c, d} and Y = {f, b, d, g}. Find (X – Y) and (Y – X).

Q20. If A and B are two given sets, Then represent the set (A – B)',using Venn diagram.

Q21. List all the element of the set A = {x : x is an integer x2 ≤ 4}

Q22. From the sets given below pair the equivalent sets.

A = { 1, 2, 3}, B = {x, y, z, t}, C = {a, b, c} D = {0, a}

Q23. Write the following as interval

(i) {x : x ∈ R, - 4 < x ≤ 6}   (ii) {x : x ∈ R, 3 ≤ x ≤ 4}

Q24. If A = {3, 5, 7, 9, 11}, B = {7, 9, 11, 13} and C = {11, 13, 15}. Find (A ∩ B) ∩ (B∪ C)

Q25. Write the set $\{\frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \frac{11}{13}\}$ in set builder form.

Q26. In a survey of 400 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.

Q27. A survey shows that 73% of the Indians like apples, whereas 65% like oranges. What % Indians like both apples and oranges?

Q28. In a school there are 20 teachers who teach mathematics or physics. Of these 12 teach mathematics and 4 teach both physics and mathematics. How many teach physics?

Q29. Let U = {1, 2, 3, 4, 5, 6} A = {2, 3} and B = {3, 4, 5}. Find A' ∩ B', A ∪ B and hence show that (A ∪ B)' = A' ∩ B'.

Q30. For any two sets A and B prove by using properties of sets that:(A ∩ B) ∪ (A − B) = A

Q31. If A, B, and C, are three sets and U is the universe set such that n(U) = 1000, n(A) = 300, n(B) = 300 and n(A ∩ B)= 200 find n (A' ∩ B')

Q32. There are 210 members in a club. 100 of them drink tea and 65 drink tea but not coffee, each member drinks tea or coffee. Find how many drink coffee, How many drink coffee, but not tea.

Q33. If P (A) = P (B), Show that A = B

Q34. In a class of 25 students, 12 have taken mathematics, 8 have taken mathematics but not biology. Find the no. of students who have taken both mathematics and biology and the number of those who have taken biology but not mathematics each student has taken either mathematics or biology or both.

Q35. A and B are two sets such that n (A − B) = (20 + x), n (B − A) = 3x and n (A ∩ B) = (x + 1). Draw a Venn diagram to illustrate this information. If n (A) = n(B), Find

(a) the value of x   (b) n(A ∪ B)

Q36. If A and B are two sets such that A ∪ B= A ∩ B, then prove that A = B

Q37. Prove that if A ∪ B = C and A ∩ B = φ then A = C − B

Q38. In a group of 65 people, 40 like cricket, 10 like both cricket and tennis. How many like tennis only and not cricket? How many like tennis?

Q39. Let A, B and C be three sets A ∪ B = A ∪ C and A ∩ B = A ∩ C show that B = C.

Q40. If U = {a, e, i. o. u}   A = {a, e, i} And   B = {e, o, u} C = {a, i, u}

Then verity that A ∩ (B − C) = (A ∩ B) − (A ∩ C)

Q41. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical C_1, 50 to chemical C_2, and 30 to both the chemicals C_1 and C_2. Find the number of individuals exposed to

(1) chemical C_1 but not chemical C_2 (2) chemical C_2 but not chemical C_1

(3) chemical C_1 or chemical C_2

Q42. In a survey it was found that 21 peoples liked product A, 26 liked product B and 29liked product C. If 14 people liked products A and B, 12 people like C and A, 14people like B and C and 8 liked all the three products. Find now many liked product C only.

Q43. A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 men and only three men got medal in all the three sports, how many received medals in exactly two of the three sports?

Q44. In a survey of 60 people, it was found that 25 people read news paper H, 26read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both Hand T, 8 read both T and I, 3 read all three newspapers. Find

(i) The no. of people who read at least one of the newspapers.

(ii) The no. of people who read exactly one newspaper.

Q45. These are 20 students in a chemistry class and 30 students in a physics class. Find the number of students which are either in physics class or chemistry class in the following cases.

(i) Two classes meet at the same hour

(ii)The two classes met at different hours and ten students are enrolled in both the courses.

Q46. In a survey of 25 students, it was found that 15 had taken mathematics, 12 had taken physics and 11 had taken chemistry, 5 had taken mathematics and chemistry, 9 had taken mathematics and physics, 4 had taken physics and chemistry and 3 had taken all three subjects. Find the no. of students that had taken

(i) only chemistry   (ii) only mathematics   (iii) only physics

(iv) physics and chemistry but mathematics

(v) mathematics and physics but not chemistry

(vi) only one of the subjects   (vii) at least one of three subjects

(viii) None of three subjects.

Q47. In a survey of 100 students, the no. of students studying the various languages were found to be English only 18, English but not Hindi 23, English and Sanskrit

Q48. English 26, Sanskrit 48, Sanskrit and Hindi 8, no language 24. Find

(i) How many students were studying Hindi?

(ii) How many students were studying English and Hindi?

Q49. In a class of 50 students, 30 students like Hindi, 25 like science and 16 like both. Find the number of students who like

(i) Either Hindi or science   (ii) Neither Hindi nor science.

Q50. In a town of 10,000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families buy newspaper C. 5% families buy A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the three papers. Find the no. of families which buy

(i) A only   (ii) B only   (iii) none of A, B, and C.

Q51. Two finite sets have m and n elements. The total no. of subsets of the first set is 56 more than the total no. of subsets of second set. Find the value of m and n.