

Assignment Ch 1 (Real Numbers)

Class X

1. Find HCF by Euclid Division algorithm (i) 45 and 117 (ii) 4052 and 12576 (iii) 81 and 237 (iv) 1288 and 575 (v) 506 and 1155 (vi) 441, 567 and 693 (vii) 391, 425 and 527
2. Using Euclid division algorithm, find which of the following pairs of numbers are co-prime (i) 231 and 396 (ii) 847 and 2160 (iii) 2618 and 2002
3. If HCF of 65 and 117 is expressible in the form $65m - 117$ then value of m is equal to
4. If $a = x^3y^2$ and $b = xy^3$; x, y are prime numbers then HCF of (a, b) is
5. Find HCF of 210 and 55 and express it in the form $210x + 55y$. Also find x and y
6. Find the largest number that will divide 398, 436 and 542 leaving remainder 7, 11 and 15 respectively.
7. Find the largest number that divides 1251, 9377 and 15628 leaving remainder 1, 2 and 3 respectively.
8. On a morning walk, three persons step off together and their steps measure 40 cm, 42 cm and 45 cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?
9. In a school there are two sections A and B of class X. There are 32 students in section A and 36 students in section B. Determine the minimum number of books required for the class library so that they can be distributed equally among students of section A or section B
10. Find the smallest number that, when divided by 35, 56 and 91 leaves remainders of 7 in each case.
11. Find the greatest number of 6 digits exactly divisible by 24, 15 and 36
12. Show that the square of any positive integer is either of the form $4q$ or $4q+1$ for some integer q
13. Show that the square of any positive integer cannot be of the form $5q+2$ or $5q+3$ for some integer q
14. If n is an odd integer, then show that $n^2 - 1$ is divisible by 8
15. Show that one and one only out of $n, n+4, n+8, n+12$ and $n+16$ is divisible by 5, where n is any positive integer.
16. Prove that $\sqrt{3} + \sqrt{5}$ is irrational.
17. Show that 12^n cannot end with the digit 0 or 5 for any natural number n
18. Write the denominator of the rational number $\frac{257}{5000}$ in the form $2^m \times 5^n$, where m, n are non negative integers. Hence, write its decimal expansion, without actual division.
19. Explain why is $3 \times 5 \times 7 + 7$ is a composite number.
20. A merchant has 175 litres of olive and 105 litres of coconut oil. He wants to sell the oil by filling the two oils in tins of equal capacity. What should be the maximum capacity of such a tin

21. Three bells ring at interval of 4, 7 and 14 minutes. All three rang at 6 am . When will they ring together again?

22. The HCF of the smallest composite number and the smallest prime number is

Assignment Ch -2 (Polynomials) Class X

1. If one zero of the quadratic polynomial is $(k-1)x^2 + kx + 1$ is -3 , then the value of k is

2. If the zeroes of the quadratic polynomial $x^2 + (a+1)x + b$ are 2 and -3 then value of a and b are

3. Find the zeroes of the following polynomials and verify the relationship between the zeroes and the

coefficients of the polynomials (i) $4x^2 - 3x - 1$ (ii) $3x^2 + 4x - 4$ (iii) $5t^2 + 12t + 7$
(iv) $t^3 - 2t^2 - 15t$ (v) $2x^2 + \frac{7}{2}x + \frac{3}{4}$ (vi) $4x^2 + 5\sqrt{2}x - 3$ (vii) $y^2 + 4\sqrt{3}y - 15$ (viii)
 $7x^2 - \frac{11}{3}x - \frac{2}{3}$ (ix) $P^2 + \frac{3}{2}\sqrt{5}p - 5$ (x) $6x^2 + x - 12$

4. If the remainder on division of $x^3 + 2x^2 + kx + 3$ by $x - 3$ is 21 , find the quotient and the value of k . Hence find the zeroes of the cubic polynomial $x^3 + 2x^2 + kx - 18$

5. If α and β are zeroes of the quadratic polynomial $f(x) = 2x^2 + 5x + 1$ then evaluate $\alpha^2 + \beta^2$ (ii) $\alpha^3 + \beta^3$ (iii)

$\alpha^4 + \beta^4$ (iv) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

(v) $\alpha^2 + \beta^2$ (vi) $(1+\alpha)(1+\beta)$ (vii) $\alpha - \beta$

6. If α and β are the zeros of the polynomial $x^2 - 5x + k$ such that $\alpha - \beta = 1$, find the value of k

7. If α and β are the zeroes of the polynomial $kx^2 + 4x + 4$ such that $\alpha^2 + \beta^2 = 24$, find the value of k

8. If α and β are the zeroes of the quadratic polynomial $x^2 - x - 2$, find a polynomial whose zeros are $2\alpha + 1$ and $2\beta + 1$

9. If α and β are the zeroes of the quadratic polynomial $2x^2 - 5x + 7$, find a polynomial whose zeros are $2\alpha + 3\beta$ and $3\alpha + 2\beta$

10. If α and β are the zeroes of the quadratic polynomial $x^2 - 3x - 2$, find a polynomial whose zeros are $\frac{1}{2\alpha + \beta}$ and $\frac{1}{2\beta + \alpha}$

11. If α and β are the zeroes of a quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$, find the quadratic polynomial

12. Find the zeroes of the polynomial $x^3 - 5x^2 - 16x + 80$, if its two zero are equal in magnitude but opposite in sign.

13. Find the zeroes of the polynomial $x^3 - 5x^2 - 2x + 24$, if it is given that the product of its two zero is 12 .

14. If the zeros of the polynomial $x^3 - 6x^2 + 3x + 10$ are $a+b$, a , $a+2b$ find a and b

15. Divide the polynomial $3x^2 - x^3 - 3x + 5$ by the polynomial $x - 1 - x^2$ and verify the division algorithm.
16. What must be added to $4x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is divisible by $x^2 + 2x - 3$
17. What must be subtracted from $8x^4 + 14x^3 - 2x^2 + 7x - 8$ so that the resulting polynomial is divisible by $4x^2 + 3x - 2$
18. Given that $\sqrt{2}$ is a zero of the cubic polynomial $6x^3 + \sqrt{2}x^2 - 10x - 4\sqrt{2}$, find its other two zeroes.
19. Obtain all zeros of the polynomial $2x^4 + x^3 - 14x^2 - 19x - 6$, if two zeroes are -2 and -1
20. On dividing the polynomial $p(x) = 8x^4 + 14x^3 - 2x^2 + 7x - 8$ by the polynomial $g(x)$, the quotient $q(x)$ and remainder $r(x)$ are $2x^2 + 2x - 1$ and $14x - 10$ respectively. Find the polynomial $g(x)$

Assignment Ch 3 (Linear equation in two variables) Class X (Mathematics)

1. The sum of two numbers is 6 and their difference is 4. Find the numbers (5,1)
2. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$. Find the numbers (5,10)
3. The sum of two numbers as well as the difference between their squares is 9. Find the numbers (5,4)
4. If we add 5 to the denominator and subtract 5 from the numerator of a fraction, it reduces to $\frac{1}{8}$. If we subtract 3 from the numerator and add 3 to its denominator, it reduces to $\frac{2}{7}$. Find the fraction (7/11)
5. The numerator and denominator of a fraction are in the ratio 2:3. If 6 is subtracted from the numerator, the fraction becomes two-thirds of its original value. Find fraction (18/27)
6. If numerator of a fraction is multiplied by 3 and its denominator is increased by 3, it becomes $\frac{3}{4}$. If instead we multiply the denominator by 3 and increase the numerator by 3, it reduces to $\frac{1}{3}$. What is fraction. (2/5)
7. Amit is ten years older than Gaurav. Five years ago one seventh of Amit age was equal to one fifth of Gaurav age. Find their present ages. (A= 40 ,G =30)
8. Two years ago, a father was five times as old as his son. Two years later, his age will be 8 more than three times the age of the son. Find the present ages. (f= 42, s=10)
9. Vikram's age is four times the sum of the ages of his two sons. Six years hence, his age will be double the sum of their ages. Find their present age. (v= 36, s=9)
10. The sum of the digits of a two digit number is 15. The number obtained by interchange the digit exceeds the given number by 9. Find the number (78)

11. The sum of a two digit number and the number formed by interchange its digit is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number. Find the first number. (64)
12. A woman has 60 notes in all of Rs 10 and Rs 20 denomination. If the total worth of the notes is Rs 850, find out how many notes of each kind does she have. (35,25)
13. 800 people collectively paid Rs 67500 for watching a film show occupying the balcony and the rear stall seats. If the charges for the balcony seat and rear stall were Rs 100 and Rs 75 respectively, how many more audience occupied the rear stall seats? (200)
14. A man travel 370 km, partly by train and partly by car. If he covers 250 km by train and the rest by car, it takes him 4 hours. But if he travel 130 km by train and the rest by car, it takes 18 minutes longer. Find the speed of the train and that of car. (100 km/h, 80 km/h)
15. A and B are cycling along the circular boundary of a playground. If they start towards each other from the opposite ends of the diameter 150 m long with A riding at twice the speed of B, then find the distance (in term of π) travelled by B when the two meet. (25π)
16. There are two examination rooms A and B. If 10 candidates are sent from A to B, the number of students in each room is the same. If 20 candidates are sent from B to A, the number of students in A is double the number of students in B. Find the number of students in each room. (100, 80)
17. A person can row 4 km upstream and 16 km downstream in 1 hour 50 minutes. He can row 20 km downstream and 20 km upstream in 4 hours 10 minutes. Find the speed of the person in still water and the speed of the current. (10, 8)
18. A train covers a certain distance at a uniform rate. On increasing its speed by 5 km/h it saves 20 minutes and on decreasing its speed by 20 km/h it loses 2 hours. Find the distance covered by train. (350 km)
19. A man sold a chair and a table together for Rs 1520 there by making a profit of 25% on the chair and 10% on the table. By selling them together for Rs 1535, he would have made a profit of 10% on the chair and 25% on the table. Find the cost price of each. (C=600, T=700)
20. A salt solution containing 60% salt and another salt solution containing 30% salt are mixed so as to get 20 litres of a 45% salt solution. Find how many litres of each type of solution should be mixed so as to achieve the desired result. (10)
21. A cyclist after riding a certain distance stopped for half an hour to repair his bicycle after which he completed the whole journey of 30 km at half the speed in 5 hours. If the break down had occurred 10 km further off, he would have done the whole journey in 4 hours. Find where the break down occurred and his original speed (ignore bicycle repair time) Ans = 10 km, 10 km/h
22. In an examination one mark is awarded for each correct answer while $\frac{1}{2}$ marks is deducted for every wrong answer. Jaya answered 120 questions and got 90 marks. How many questions did she answer correctly? (100)

23. A person rowing at the rate of 5 km/h in still water , takes thrice as much time in going 40 km upstream as in going 40 km downstream. Find the speed of the stream. (2.5 km/h)

24. A railway half ticket costs half the full fare, but the reservation charges are the same on a half ticket as on a full ticket. One reserved first class ticket from the station A to B costs Rs 2530. Also one reserved first class ticket and one reserved first class half ticket from A to B costs Rs 3810. Find the full fare and reservation charge. (2500, 30)

25. Vijay had some bananas ,and he divided them into two lots A and B. He sold the first lot at the rate of Rs 2 for 3 bananas and the second lot at the rate of Rs 1 per banana, got a total of Rs 400. if he had sold the first lot at the rate of Rs 1 per bananas and the second lot at the rate of Rs 4 for 5 bananas , got a total of Rs 460. Find the total number of bananas he had. (500)

26. It takes 12 hours to fill a swimming pool using two pipes. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter for 9 hours, only half the pool can be filled. How long would it take for each pipe to fill the pool separately? (20 h ,30 h)

27. Graphically, solve the equations $2x+y=6$ and $2x-y=-2$ and find the ratio of the areas of the two triangles formed by these lines with the x-axis and the lines with the y axis. (4:1)

28. Determine, graphically, the vertices of the triangle formed by the lines , (i) $y=x$, $3y=x$, $x+y=8$ (0,0)(4,4)(6,2) (ii) $3x-y=3$, $2x-3y=2$, $x+2y=8$ (1,0)(2,3)(4,2)

29. Draw the graphs of the equations $x=3$, $x=5$ and $2x-y-4=0$. Also find the area of the quadrilateral formed by the lines and the x axis. (8 sq unit)

30. Solve the equations $21x +47y = 110$, $47x+ 21y = 162$ Ans= (x=3. y=1)

31. Find the value of unknown when equation has infinite many solutions. (i) $x+(k+1)y =4$, $(k+1)x +9y = 5k +2$ (Ans=2) (ii) $(k-1) x -y =5$, $(k+1)x + (1-k)y = 3k+1$ (ans=3) (iii) $2x-y =5$, $(p+q)x + (2q-p)y = 15$ Ans (p=5 ,q =1)

32. Find the value of unknown when equation has no solutions (i) $(3k+1)x +3y-2 =0$, $(k^2+1)x +(k-2)y - 5=0$ (Ans= -1) (ii) $3x +y =1$, $(2k-1) x + (k-1)y -(2k+1) =0$ (ans=2)

33. Find the value of unknown when equation has unique solution (i) $9x +py-1 =0$, $3x+4y-2 =0$ (ii) $2x-3y=1$, $kx +5y=7$