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10TH CBSE MATHS Real Number Polynomials Pair Of Linear Equation In Two Variables 2 3 5

10th Standard

Maths

28 x 2 = 56

1) Find the HCF of 96 and 404 by the prime factorisation method. Hence, find their LCM.

2) Given that HCF (306, 657) = 9, find LCM (306, 657).

3) Write down the decimal expansions of those rational numbers in which have terminating decimal expansions.
$\frac{15}{1600}$

4) Find the HCF and LCM of the following integers by applying the prime factorisation method.
17, 23 and 29

5) Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.

6) Find a quadratic polynomial with the given number as the sum and product of its zeroes respectively
$\frac{1}{4}, -1$

7) Find a quadratic polynomial with the given numbers as the sum and product of its zeroes respectively.
$-\frac{1}{4}, \frac{1}{4}$

8) On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2} \& \frac{c_1}{c_2}$ find out whether the following pair of linear equations are consistent, or inconsistent.
3x + 2y = 5 ; 2x – 3y = 7

9) On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2} \& \frac{c_1}{c_2}$ find out whether the following pair of linear equations are consistent, or inconsistent.
2x – 3y = 8 ; 4x – 6y = 9

10) Explain whether (7 x 13 x 11) + 11and (7 x 6 x 5 x 4 x 3 x 2 x 1) + 3 are composite numbers.

11) The length, breadth and height of a room are 8m 50 cm, 6 m 25 cm and 4 m 75 cm respectively. Find the length of the longest rod that can measure the dimensions of the room exactly.

12) Show that $5\sqrt{6}$ is an irrational number.

13) Write the denominator of the rational number $\frac{257}{500}$ in the from 2^m x 5^n, where m and n are non-negative integers. Hence write its decimal expansion without actual division.

14) Express the HCF of 234 and 111 as 234x + 111y, where x and y are integers

15) Given that $\sqrt{2}$ is irrational, prove that $(5+3\sqrt{2})$ is an irrational number.

16) If α and β are the zeroes of the quadratic polynomial $f(x)=3x^2-5x-2$, then evaluate $α^3+β^3$.

17) If α and β are the zeroes of the polynomial $2y^2+7y+5$, then find the value of α+β+αβ.

18) If zeroes of the polynomial $x^2 + 4x + 2a$ are $α$ and $\frac{2}{α}$, then find the value of a.

19) Find the zeroes of the quadratic polynomial $\sqrt{3}x^2 - 8x + 4\sqrt{3}$

20) If $α$ and $β$ are the zeroes of the polynomial f(x) = x^2 - 6x + k, find the value of k, such that $α^2 + β^2 = 40$

21) If α and β are the zeroes of the polynomial $2x^2 - 4x + 5$, find the value of :
(i) $\alpha^2 + \beta^2$
(ii) $\frac{1}{\alpha} + \frac{1}{\beta}$
(iii) $(\alpha - \beta)^2$
(iv) $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$
(v) $\alpha^3 + \beta^3$

22) Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients of the polynomial.
$5x^2 -8x - 4$

23) Two numbers are in the ratio 5:6. If 8 is subtracted from each of the numbers, the ratio becomes 4:5. Find the numbers.

24) Find the value of k, for which system of equations kx+3y=3 and 12x+ky=6 represent parallel lines.

25) For what value of k, the pair of linear equations x+2y=3, 5x+ky+7=0 represents
(i) Intersecting lines
(ii) Parallel lines
Is there any value of k for which the given equations represents coincident lines?

26) A man travels 600km partly by train and partly by car. It takes 8h and 40 min if he travels 320 km by train and the rest by car. It would take 30 min more if he travels 200 km by train and the rest by car. Find the speed of the train and the car separately.

27) If a motorboat can travel 30 km upstream and 28km down stream in 7 h, it can travel 21 km upstream and return in 5 h. Find the speed of the boat in still water and the speed of the stream.

28) Solve the following system of linear equations by substitution method:
2x - y = 2
x + 3y = 15

12 x 3 = 36

29) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroe and the coefficients.
$4u^2 + 8u$

30) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroe and the coefficients.
$t^2 - 15$

31) There are 156, 208 and 260 students in groups A, B and C respectively. Buses are to be hired to take them for a field trip. Find the minimum number of buses to be hired, if the same number of students should be accommodated in each bus.

32) Find the greatest number of six digits exactly divisible by 18, 24 and 36

33) Find the zeros of the quadratic polynomial $x^2 +7x+10$ and verify relationship between the zeros and the coefficients.

34) If a and β are zeroes of the polynomial $x^2-P(x+1)+c$ such that (a+1) (β+1)=0, then find the value of c.

35) If α and β are the zeroes of the polynomial $6y^2 - 7y + 2$, find a quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$

36) If α and β are the zeroes of the quadratic polynomial f(x) = x^2 -3x -2, find a polynomial whose zeroes are $\frac{2\alpha}{\beta}$ and $\frac{2\beta}{\alpha}$

37) Verify that x=2 is a solution of the linear equation 2x+7=13-x.

38) The sum of a two-digit number and number obtained by reversing the order of digits 99. If the digits of the number differ by 3, then find the numbers.

39) Form the pair of linear equations in the following problems, and find their solutions (if they exist) by the elimination method:
A lending library has fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs 27 for a book kept for seven days, while Susy paid Rs 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.

40) On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$ and c$_1$/c$_2$ and without drawing them, find out whether the lines representing the following pairs of linear equations intersect at a point or are parallel or coincide.
x - 2y + 5 = 0, 8y - 4x + 20 = 0

$$15 \times 4 = 60$$

41) Prove that $\sqrt{2}$ is an irrational .

42) Prove that $\sqrt{3}$ is an irrational number.

43) Romila went to a stationary shop and purchased 2 pencils and 3 erasers for Rs. 9. Her friend Sonali saw the new variety of pencils and erasers with Romila and she also bought 4 pencils and 6 erasers of the same kind for Rs.18. Find the cost of each pencil and each eraser.

44) Use elimination method to find all possible solutions of the following pair of linear equation
2x+3y=8 and 4x+6y=7

45) One says, 'Give me a hundred, friend! I shall then become twice as rich as you'. The other replies, 'If you give me ten, I shall be six times as rich as you'. Tell me what is the amount of their (respective) capital? [From the Bijaganita of Bhaskara II)

46) Solve 2x + 3y = 11 and 2x - 4y = - 24 and hence find the value of m for which y = mx + 3.

47) The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save Rs 2000 per month, then find their monthly incomes. Form a pair of linear equations from the above data and solve them by elimination method. Also, verify the solution.

48) A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km down-stream. Determine the speed of the stream and that of the boat in still water.

49) Formulate the following problems as a pair of equations, and hence find their solutions:
2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the work, and also that taken by 1 man alone.

50) If α and β are zeroes of the quadratic polynomial p(x)=6x^2+x-1, then find the value of $\frac{\alpha}{\beta} + \frac{\alpha}{\alpha} + 2\left(\frac{1}{\alpha} + \frac{1}{\beta}\right) + 3\alpha\beta$

51) A and B are two points 150 km apart on a highway. Two cars start from A and B at the same time. If they move in the same direction they meet in 15 hours. But if they move in the opposite direction, they meet in 1 hour. Find their speeds.

52) If 2 is subtracted from the numerator and 1 is added to the denominator, a fraction becomes $\frac{1}{2}$ but when 4 is added to the numerator and 3 is subtracted from the denominator, it becomes $\frac{3}{2}$. Find the fraction.

53) The age of the father is twice the sum of the ages of his 2 children. After 20 years, his age will be equal to the sum of the ages of his children. Find the age of the father

54) The sum total of the ages of father and son is 55 years. If the father was to live till his son's age equals his present age. the total of their ages would be 93 years. Find their present ages.

55) A railway half ticket cost 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 stations A to B costs Rs.2530. Also, one reserved first class ticket and one reserved first class half ticket from stations A to B costs Rs.3810. Find the full first class fare from stations A to B and also the reservation charges for a ticket.

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