

Class 9th Mathematics session 2024-25

Unit-1

Matrices and determinants

Short Question

1. What is a matrix? Give two examples.
2. What is the order of the matrix? Give two examples.
3. What is meant by negative of matrix?
4. If $A = \begin{bmatrix} -1 & 2 \\ 2 & 1 \end{bmatrix}$, then find $A + \begin{bmatrix} 1 & 1 \\ 2 & 0 \end{bmatrix}$.
5. If $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$, and $B = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, then find $(A-B)^t$ (17/I)
6. Define transpose of matrix.
7. What are equal matrices? Give one example.
8. If $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$, then verify that $A + A^t$ is symmetric. (19/I)
9. Find product of $A = \begin{bmatrix} 1 & 3 \\ 2 & -3 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 0 \\ 3 & 2 \end{bmatrix}$ i.e. AB
10. Find the additive inverse of matrix. $\begin{bmatrix} -2 & 5 \\ 3 & 0 \end{bmatrix}$ (II-24/24/I)
11. If $D = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 0 & 2 \end{bmatrix}$, then find $D + \begin{bmatrix} 0 & 1 & 0 \\ 2 & 0 & 1 \end{bmatrix}$.
12. Find the multiplicative inverse if $B = \begin{bmatrix} 1 & 2 \\ -3 & -5 \end{bmatrix}$
13. What is a row matrix give one examples. (16/I)
14. If $C = \begin{bmatrix} 7 & -9 \\ 3 & 5 \end{bmatrix}$, then find whether C is singular or non-singular.
15. Determine whether the given matrices are multiplicative inverses of each other. $\begin{bmatrix} 3 & 5 \\ 4 & 7 \end{bmatrix}$ and $\begin{bmatrix} 7 & -5 \\ -4 & 3 \end{bmatrix}$.
16. If $A = \begin{bmatrix} \frac{1}{3} & 5 \\ b & 9 \end{bmatrix}$ is a singular matrix then find the value of 'b'.
17. What is a column matrix give two examples.
18. Find the product of matrices. $\begin{bmatrix} 1 & 2 \\ -3 & 0 \\ 6 & -1 \end{bmatrix} \begin{bmatrix} 4 & 5 \\ 0 & -4 \end{bmatrix}$. (19/I)
19. What is a rectangular matrix give two examples. (13/I)
20. Find the values of a,b,c and d which satisfy the matrix equation (22/I)
$$\begin{bmatrix} a + c & a + 2b \\ c - 1 & 4d - 6 \end{bmatrix} = \begin{bmatrix} 0 & -7 \\ 3 & 2d \end{bmatrix}$$
21. Write down the definition of a square matrix. Give one examples. (23/I-14/II)
22. If $A = \begin{bmatrix} 3 & 0 \\ -1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 6 \\ 5 \end{bmatrix}$ then find BA .
23. What are null or zero matrix? Give one example.
24. Determine whether the given matrices are multiplicative inverses of each other.

$$\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix} \text{ and } \begin{bmatrix} -3 & 2 \\ 2 & -1 \end{bmatrix}$$

25. How do we find the transpose of a matrix? Give one example.

26. Find the transpose of a matrix. $\begin{bmatrix} 1 & 2 \\ 2 & -1 \\ 3 & 0 \end{bmatrix}$

27. State and prove the commutative law under addition of matrices.

28. Verify that if $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ then $(A^t)^t = A$ (21/II)

29. Verify that if $A = \begin{bmatrix} 1 & 1 \\ 2 & 0 \end{bmatrix}$ then $(B^t)^t = B$ (23/II)

30. State and prove the associative law under addition of matrices.

31. Find the negative of matrix B if $B = \begin{bmatrix} 2 & -5 \\ 6 & 7 \\ -2 & 1 \end{bmatrix}$

32. How do we find the negative of a matrix? Give one example.

33. What is a symmetric matrix? Give one example. (17/I -17/II,15/II,14/I)

34. What is a skew-symmetric matrix? Give one example.

35. Find $\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$

36. Write the definition of a diagonal matrix. Give one example. (18/I)

37. What is a scalar matrix? Give one example. (22/II)19/II,18/II,15/I

38. What is an identity matrix? Give two examples.

39. What is a additive identity of a matrix? Explain with example.

40. If $B = \begin{bmatrix} 0 & 7 \\ -3 & 8 \end{bmatrix}$ then find $(-2)B$

41. What is additive inverse of a matrix? Explain with example.

42. Find product of $[6 \ 0] \begin{bmatrix} 4 \\ 0 \end{bmatrix}$ (22/I 13/I)

43. Find product of $[1 \ 2] \begin{bmatrix} 5 \\ -4 \end{bmatrix}$ (22/II)

44. Find product of $[1 \ 2] \begin{bmatrix} 5 \\ 4 \end{bmatrix}$ (23/I)

45. If $C = [1 \ -1 \ 2]$ then find $C + [-2 \ 1 \ 3]$ (14/I)

46. Define singular matrix. Give one example.

47. Define non-singular matrix. Give one example. (14/II)

48. Find the determinant of the matrix $A = \begin{bmatrix} 3 & 1 \\ -1 & 0 \end{bmatrix}$ (14/II)

49. Check the matrix $\begin{bmatrix} 5 & -10 \\ -2 & 4 \end{bmatrix}$ is a singular or non- singular.

50. If $B = \begin{bmatrix} 4 & 1 \\ 3 & 2 \end{bmatrix}$, then find whether B is a singular or non- singular.

51. How do we find the adjoint of a matrix? Explain with example.

52. How do we find the multiplicative inverse of a matrix? Give one example.

53. Find the determinant of the matrix $\begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$

54. If $\begin{vmatrix} -2 & x \\ 5 & -10 \end{vmatrix} = 0$ then find the value of 'x'

55. If $X + \begin{bmatrix} -1 & 3 \\ 2 & 7 \end{bmatrix} = \begin{bmatrix} 7 & -1 \\ 0 & 2 \end{bmatrix}$ then find the value of 'X'

56. If $\begin{bmatrix} a+3 & 4 \\ 6 & b-1 \end{bmatrix} = \begin{bmatrix} -3 & 4 \\ 6 & 2 \end{bmatrix}$ then find 'a' and 'b' (I/21/19/II)
57. Find |D| if $\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ (23/II 18/II,15/II)
58. Find the determinant of the matrix $B = \begin{bmatrix} 3 & 2 \\ 3 & 2 \end{bmatrix}$ (14/II)
59. Find the determinant of the matrix $A = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ (14/I)
60. Find the determinant of the matrix $A = \begin{bmatrix} 1 & 3 \\ 2 & -2 \end{bmatrix}$ (18-I,16/I-15/I)
61. If $A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 7 \\ -3 & 8 \end{bmatrix}$ then find $3A - 2B$ (16/I)
62. Find the Transpose of the Matrix $\begin{bmatrix} 5 & 1 & -6 \end{bmatrix}$ (21/I)
63. Write order of the matrix $C = \begin{bmatrix} 2 & 4 \end{bmatrix}$ (21/II)
64. Define square matrix

Long Question

1. Solve with Cramer Rule $3x - 4y = 4$ $X + 2y = 8$ (15/I)
2. Solve with Cramer Rule $3x - 2y = 1$ $-2X + 3y = 2$ (18/II,15/II)
3. If $A = \begin{bmatrix} 4 & 0 \\ -1 & 2 \end{bmatrix}$ $D = \begin{bmatrix} 3 & 1 \\ -2 & 2 \end{bmatrix}$ then verify that $(DA)^{-1} = A^{-1} D^{-1}$
4. If $A = \begin{bmatrix} 4 & 0 \\ -1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -4 & -2 \\ 1 & -1 \end{bmatrix}$ then verify $(AB)^{-1} = B^{-1} A^{-1}$ (13 /I)
5. By using matrix inversion method, solve the following equation (24/I)
- $$4x - y = 2 \quad x - 2y = -1.$$
4. Solve with Cramer Rule $2x + y = 3$ $6X + 5y = 1$ (14/I)
5. Let $A = \begin{bmatrix} -1 & 3 \\ 2 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ -3 & -5 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$ verify that $A(B + C) = AB + AC$ (board Q)
7. Solve with Cramer Rule $2x - 2y = 4$ $3x + 2y = 6$ (18/I, 16/I&II,14/I)
8. If $A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 7 \\ -3 & 8 \end{bmatrix}$ then find $(A - B)^t = A^t - B^t$
9. If $A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 7 \\ -3 & 8 \end{bmatrix}$ then find $2A^t - 3B^t$
10. If $\begin{bmatrix} 7 & 10 \\ 8 & 1 \end{bmatrix} = 2 \begin{bmatrix} 2 & 4 \\ -3 & a \end{bmatrix} + 3 \begin{bmatrix} 1 & b \\ 8 & -4 \end{bmatrix}$ then find 'a' and 'b'
11. Solve with Cramer Rule
- $$3x - 2y = -6 \quad 5x - 2y = -10. \quad (19/I)$$

- Solve with Cramer Rule $2x - 2y = 4$ $-5x - 2y = -10$ (22/II) 12.
- Solve the system of linear equation by the Cramer Rule $2x - 2y = 4$ $-7x - 2y = -10$ (II-24)

13. Let $A = \begin{bmatrix} -1 & 3 \\ 2 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ -3 & -5 \end{bmatrix}$ verify that $(AB)^t = B^t A^t$

14. The third angle of an isosceles is 16° less than the sum of the two equal angles. Find the three of a triangle by matrix inversion method

15. By using matrix inversion method, solve the following equation

$$4x + y = 9 \quad -3x - y = -5. \quad \text{(I-23/17/I)}$$

16. Solve with Cramer Rule $4x + 2y = 8 \quad 3x - y = -1$ (II-23/17/II, 19/II)

17. For the Matrices $B = \begin{bmatrix} 1 & 2 \\ -3 & -5 \end{bmatrix}$ and $C = \begin{bmatrix} -2 & 6 \\ 3 & -9 \end{bmatrix}$ verify that $(BC)^t = C^t B^t$ (21/I)

18. If $B = \begin{bmatrix} 3 & -1 \\ 2 & -2 \end{bmatrix}$ then find BB^{-1} (22/II)

19. Solve by using inversion method $4x - y = 2 \quad X - 2y = -1$ (24/I)

Unit-2 Real and Complex Numbers

Short Questions

1. Define rational numbers. Give one example. (18 / I)
2. Define irrational numbers. Give one example. (18 / II)
3. What is the multiplicative property of real numbers? Explain
- 10 . What is the cancellation property for addition of real numbers? Explain
- 11 . What is the cancellation property for multiplication of real numbers? Explain
- 12 . Simplify the radical expression $\sqrt[4]{32}$ (23/II)
- 13 . What is the trichotomy property of real numbers? Explain (23/II)
- 14 . What is the transitive property of real numbers? Explain
- 15 . What is the additive property of real numbers for inequalities? Explain
- 16 . Evaluate $(-i)^8$ (24/I)
- (ii) $(i)^{27}$ (iii) $(-i)^5$ (14 / I)
- 17 . What is the multiplicative property of real numbers for inequalities? Explain
- 18 . Simplify the radical expression $\sqrt[3]{-125}$ (16 / II)
- 19 . Express $(2-3i)(\overline{3-2i})$ in to the form $(a+bi)$
- 20 Write real and imaginary part of $-2-2i$ (17/II)
- 21 Simplify $(-7 + 3i)(-3 + 2i)$ in the form $(a+bi)$ (19 / II)
- 22 What is the multiplicative inverse property of real numbers for inequalities? Explain
- 23 . What is the concept of radicals and radicands? Explain.

- 24 . Simplify the radical expression $\sqrt[3]{\frac{-8}{27}}$ (ii) Simplify $\left(\frac{8}{125}\right)^{-4/3}$ (23/I-15 / II)
- 25 Simplify the radical expression $\sqrt[4]{81y^{-12} x^{-8}}$ (19 / II)
- 26 Simplify the radical expression $\sqrt[4]{64y^9 x^5}$ (24/I)
- 27 . Write five properties of radicals.
- 28 . Write seven laws of exponents/indices.
- 29 . Simplify $\frac{x^{-2} y^{-3} z^7}{x^{-3} y^4}$ (17/I)
- 30 Simplify $\left(\frac{x^{-2} y^{-1} z^{-4}}{x^4 y^{-3} z^0}\right)^{-3}$ (22/II-14/I)
- 31 $(2 x^5 y^{-4})(-8 x^{-3} y^2)$ (22/II-18 / II)
- 32 . Simplify $5^{2^3} \div (5^2)^3$ (22/I)
- 33 $(x^3)^2 \div x^{3^2}$ (22/II-23/II-15 / II & 14 / II)
- 34 . Write the definition of a complex number.
- 35 . Evaluate i^{50} (I/21/18/I-17/I -15 / II)
- 36 . What is the conjugate of a complex number? Explain with Examples.
- 37 Solve the following equation for real x and y :
 $(3 - 2i)(x + yi) = 2(x - 2yi) + 2i - 1$.
- 38 If $z=2+3i$ and $w=5-4i$, then prove that $\left[\frac{z}{w}\right] = \frac{\bar{z}}{\bar{w}}$.
- 39 Simplify $\frac{4(3)^n}{3^{n+1}-3^n}$. (17/II)
- 40 . Separate real and imaginary parts of $(-1 + \sqrt{-2})^2$.
- 41 . Find the value of x and y if $x + iy + 1 = 4 - 3i$ (21/I)
- 42 . Express the complex number $2(5 + 4i) - 3(7 + 4i)$ in the Standard form $a + bi$. Where a and b are real numbers.
- 43 . Simplify $(\sqrt{5} - 3i)^2$ and write your answer in the form of $a + bi$. (15 / I & 16 II)
- 44 . Simplify $\frac{-2}{1+i}$ and write your answer in the form of $a + bi$
- 45 Simplify $\frac{1}{1+2i}$ and write your answer in the form of $a + bi$ (19-23/I)
- 46 . If $z = 2 + i$, calculate $z + \bar{z}$. (24 / II)
- 47 . Solve the equation $(2 - 3i)(x + yi) = 4 + i$ for real x and y .

48 . Simply it $\sqrt{\frac{(216)^{2/3} \times (25)^{1/2}}{(0.04)^{-3/2}}}$ (15 / II)

49 . Simply It $\sqrt{\frac{(216)^{2/3} \times (25)^{1/2}}{(0.04)^{-1/2}}}$ (II-23/II-22/16 / I & II)

50 . Simply It $\frac{(2)^{1/3} \times (27)^{1/3} \times (60)^{1/2}}{(180)^{1/2} \times (4)^{-1/3} \times (9)^{1/4}}$ (18/I,13/ I)

51 . Simply It $\frac{(81)^n \times 3^5 - (3)^{4n-1} (243)}{(9^{2n})(3^3)}$ (24-23-15/I)

52 . Simply It $(2x^5y^{-4})(-8x^{-3}y^2)$ (13 / I)

53 . Prove that $\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a} = 1$ (I-22/14 / II)

54 Simply It $\left(\frac{a^{2l}}{a^{l+m}}\right) \times \left(\frac{a^{2m}}{a^{n+m}}\right) \times \left(\frac{a^{2n}}{a^{l+n}}\right)$ (18 / II)

55 Simply It $\left(\frac{a^p}{a^q}\right)^{p+q} \times \left(\frac{a^q}{a^r}\right)^{q+r} \div 5(a^p \cdot a^r)^{p-r}$ (II-24/17/I)

56 . Use laws of exponent to simplify it.

$\frac{(243)^{-\frac{2}{3}} (32)^{-1/5}}{\sqrt{(196)^{-1}}}$ (I-21/19/I-14/I) (17/II)

57 . Write the real and imaginary parts of the number $(2 + 0i)$. (14 / I)

58 Write the real and imaginary parts of the number $(-1 + 2i)$. (21 / II)

59 . Express the given decimal $0.\overline{23}$ in the form of $\frac{p}{q}$, where $p, q \in z$ & $q \neq 0$. (16 / I)

60 Express the given decimal $0.\overline{5}$ in the form of $\frac{p}{q}$, where $p, q \in z$ & $q \neq 0$. (19 / I)

61 Simplify $\sqrt[5]{\frac{3}{32}}$ (16 / I)

62 If $Z = \frac{4-3i}{2+4i}$ then calculate $z - \bar{z}$ (19 / II)

Unit-3 LOGARITHMS

1. What is the scientific notation of representing the number? Explain with example.
2. Write the following numbers in scientific notation. (i) 5700 (ii) 0.0000067 (iii) 416.9
3. Write in scientific notation 83,000 (18/II)
4. Write in scientific notation 49,800,000 (18/I)
5. Write in scientific notation 0.0074 (17/I)
6. Express the following numbers in ordinary notation

7. (i) 5.06×10^5 (ii) 7.782×10^{-4} (iii) 9.018×10^{-6} (19/II, 13/I, 16/II)
8. Express the following numbers in ordinary notation 6×10^{-4} (19 / I)
9. What is the logarithm of a real number? Explain with example. (23/II)
10. Prove that $\log_a(mn) = \log_a m + \log_a n$
11. Find the common logarithm of the number 0.0034
12. Find the value of 'a' from $\log_a 6 = 0.5$ (23/II-21 / I)
13. Evaluate $\log_2 \frac{1}{128}$ (15/I)
14. 9. Find the value of x from $\log_{81} 9 = x$
15. 10. Find the value of x from $\log_{64} 8 = \frac{x}{2}$ (23-13/I, 16/I)
16. Find the common logarithm of the number 29.326
17. Find $\log_4 2$.
18. Find the common logarithm of 0.3206.
19. Calculate $\log_2 3 \times \log_3 8$ (23/I)
20. Calculate $\log_5 3 \times \log_3 25$ (19/I)
21. Calculate $\log_3 2 \times \log_2 81$ (21/II)
22. If $\log 2 = 0.3010$, $\log 3 = 0.4771$ then find the value of $\log \frac{8}{3}$
23. If $\log 2 = 0.3010$, $\log 3 = 0.4771$, $\log 5 = 0.6990$, then find the value of $\log 30$ (24/II)
24. 18. Given that $A = A_0 e^{-kd}$. If $k = 2$, what should be the value of d to make $A = \frac{A_0}{2}$
25. If $\log 2 = 0.3010$, $\log 3 = 0.4771$, $\log 5 = 0.6990$, then find the value of $\log \frac{16}{15}$
26. Find the value of x in $\log x = -1.6238$
27. Find the value of x in $\log_{64} x = \frac{-2}{3}$ (22/II-17/I, 18/II)
28. If $\log 2 = 0.3010$, $\log 3 = 0.4771$ then find the value of $\log 24$ (15/II)
29. Find the value of x from $\log_3 x = 4$ (22/I -17/II, 14/I, 16/II)
30. Find the value of x from $\log_x 64 = 2$ (21/II -14/II)
31. Find the value of a $\log_a 6 = 0.5$ (24/II)
32. Find the value of x from $\log_2 x = 5$ (19/II, 15/II)
33. Find the value of x from $\log_3 x = 5$ (18/I)
34. If $\log 2 = 0.3010$ then find the value of $\log 32$ (Board)
35. Use logarithm to find the value of 0.2913×0.004236 (16/I)
36. Write in single logarithm $\log 21 - \log 5$ (22/I - 14/II)
37. Find the value of x in $\log x = 0.1821$.
38. Write in single logarithm $2 \log x - 3 \log y$ (24/I, 22-17-14/II)
39. Find the value of x from $\log_{625} 5 = \frac{1}{4} x$ (24/I)
40. Use log table to find $\sqrt[5]{2.709} \times \sqrt[7]{1.239}$ (16/I)
41. Use log table to find the value. $\frac{0.678 \times 9.01}{0.0234}$ (23-22-21/II -17/II, 18-II, 19/I, 16/II)
42. Find the value by the use of log: $\sqrt[3]{25.47}$ (14/I)
43. Use log table to find the value of $\frac{(1.23)(0.6975)}{(0.0075)(1278)}$ (21/I-14/II)
44. Use log table to find the value of $\frac{(438)^3 \sqrt{0.056}}{(388)^4}$ (24-13/I)

45. Use log table to find the value of $\sqrt[5]{2.709} \times \sqrt[7]{1.239}$ (15/I)
46. Use log table to find the value of 0.8176×13.64 (II-24/17/I, 18/I)
47. Use log table to find the value of $\frac{(8.97)^3 \times (3.95)^2}{\sqrt[3]{15.37}}$ (23-22/I -19/II,15/II)
48. If $\log 2 = 0.3010$, $\log 3 = 0.4771$, $\log 5 = 0.6990$, then find the value of $\log \sqrt{3\frac{1}{3}}$.
49. Define characteristic.
50. If $V = \frac{1}{3}\pi r^2 h$, find V when $\pi = \frac{22}{7}$, $r = 2.5$ and $h = 4.2$.
51. Find by using logarithmic table. $\sqrt[3]{\frac{0.7214 \times 20.37}{60.8}}$.
52. Write into Sum or Difference Form. $\text{Log } \frac{25 \times 47}{29}$ (21/I)

Unit-4 Algebraic Expressions and Algebraic Formulas

- Write the definition of algebraic expression. Give two examples.
- Write the definition of polynomial. Give two examples.
- What is rational expression? Give two examples.
- Reduce the rational expression to the lowest form. $\frac{8a(x+1)}{2(x^2-1)}$ (24/I)
- Reduce the rational expression to the lowest form.
 $\frac{(x+2)(x^2-1)}{(x+1)(x^2-4)}$ (19/I)
- Evaluate $\frac{x^3y-2z}{xz}$ for $x = 3$, $y = -1$, $z = -2$
- Perform the indicated operation and simplify $\frac{1+2x}{1-2x} - \frac{1-2x}{1+2x}$
- Factorize $64x^3 + 343y^3$. (15 / II) [2 Marks]
- If $x+y=7$ and $xy=12$, then find the value of x^3+y^3 .
- Factorize $8x^3 + 125y^3$. (17/I)
- If $x + \frac{1}{x} = 8$, then find the value of $x^3 + \frac{1}{x^3}$ (18/II 4 mark)
- Factorize $8x^3 - \frac{1}{27y^3}$. (2016 / II)
- What is surd? Give examples. (24-18-13 / I)
- Simplify $\frac{4}{5} \sqrt[3]{125}$

15. Simplify by combining similar terms. $\sqrt{3} (2\sqrt{3} + 3\sqrt{3})$ (22/II-23/I)
16. Simplify $(\sqrt{x} + \sqrt{y})(\sqrt{x} - \sqrt{y})(x + y)(x^2 + y^2)$
17. Write with example the definition of monomial surd. (18/II)
18. Write with example the definition of binomial surd.
19. Rationalize the denominator $\frac{58}{7-2\sqrt{5}}$
20. If $x = 3 + \sqrt{8}$, then evaluate $\frac{1}{x}$
21. If $P = 2 + \sqrt{3}$, then evaluate $P^2 - \frac{1}{P^2}$ (21/II-22-23/I)
22. If $X = 2 + \sqrt{3}$, then evaluate $X + \frac{1}{X}$ (23/II)
23. If $x + \frac{1}{x} = 3$, find $x^4 + \frac{1}{x^4}$. (18/I)
24. Find the product $\left(\frac{4}{5}x - \frac{5}{4x}\right)\left(\frac{16}{25}x^2 + \frac{25}{16x^2} + 1\right)$ (16 / I)
25. Reduce to lowest form $\frac{(x+y)^2 - 4xy}{(x-y)^2}$, (19/II, 15 / II)
26. Find the value ab , when $a + b = 5$, $a - b = \sqrt{17}$. (18/II-2015 / I) [2 marks]
27. Find the value $27x^3 + \frac{1}{27x^3}$ if $\left(3x + \frac{1}{3x}\right) = 5$ [4 Marks] (16 / II)
28. If $a + b + c = 6$ and $a^2 + b^2 + c^2 = 24$ then find the value of $ab + bc + ca$ (19/I)
29. If $ab + bc + ca = 3$ and $a^2 + b^2 + c^2 = 43$ then find the value of $a + b + c$ (19/II)
30. If $x^2 + y^2 + z^2 = 78$ and $xy + yz + zx = 59$ then find $x + y + z$. (17/II, 17/I)
31. If $x^2 + y^2 + z^2 = 98$ and $xy + yz + zx = 42$ then find $x + y + z$. (24/I)
32. If $x^2 + y^2 + z^2 = 81$ and $xy + yz + zx = 46$ then find $x + y + z$. (24/II)
33. If $x^2 + y^2 + z^2 = 64$ and $x + y + z = 12$ then find $xy + yz + zx$. (22-23/II)
34. Find the value of $a^2 + b^2$ if $a + b = 7$, $a - b = 3$. (23-15/ II) [2 Marks]
35. Simply $\frac{1+\sqrt{2}}{\sqrt{5}+\sqrt{3}} + \frac{1-\sqrt{2}}{\sqrt{5}-\sqrt{3}}$ (15 / II) [4 marks]
36. If $q = \sqrt{5} + 2$ then find the value of $q^2 + \frac{1}{q^2}$ (14 / II) [4 marks]
37. Find $a^2 + b^2$ if $a + b = 10$, $a - b = 6$. (14 / II) [2 marks]
38. If $x = -1$, $y = -9$, $z = 4$, find $\frac{x^3y - 2z}{xz}$ (14 / II) [2 marks]

39. If $x = 2 + \sqrt{3}$ then find, $x - \frac{1}{x}$ and $(x - \frac{1}{x})^2$ (21-14 / I) [4 marks]
40. Rationalize $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ (17/II)
41. Rationalize $\frac{15}{\sqrt{31}-4}$ (23/II)
42. Rationalize $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$ (14/I)
43. Simplify $(\sqrt{2} + \frac{1}{\sqrt{3}})(\sqrt{2} - \frac{1}{\sqrt{3}})$ (21-14 / II)
44. Simplify $(x^2 - 49) \cdot \frac{5x+2}{x+7}$ (23 / I) [2Marks]
45. Simplify $\frac{7xy}{x^2-4x+4} \div \frac{14y}{x^2-4}$ (16/I)
46. Simplify $(\sqrt{5} + \sqrt{3})^2$ (16 / II)
47. Simplify $\frac{x^2-4x+4}{2x^2-8}$ (17-13 / I) [2 Marks]
48. If $x = \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$ then find $x + \frac{1}{x}$ and $x^2 + \frac{1}{x^2}$ (13 / I)
49. If $x - \frac{1}{x} = 7$ then find $x^3 - \frac{1}{x^3}$ (16 / I) [4marks]
50. If $x = 2 - \sqrt{3}$, then evaluate $\frac{1}{x}$ (22/II-19/I)
51. Determine the rational number "a" and "b" if $\frac{\sqrt{3}-1}{\sqrt{3}+1} + \frac{\sqrt{3}+1}{\sqrt{3}-1} = a + b\sqrt{3}$
52. Simplify $\frac{\sqrt{18}}{\sqrt{3}\sqrt{2}}$ (21/I,19/II)
53. If $x = 4, y = -2, z = -1$, find $\frac{x^2y^3-5z^4}{xyz}$ (21/II-18/I)
54. Reduce to lowest form $\frac{lx+mx-ly-my}{3x^2-3y^2}$
55. Reduce to lowest form $\frac{x^2-4x+4}{2x^2-8}$ (II-24/17/I)
56. Rationalize the denominator $\frac{2}{\sqrt{5}-\sqrt{3}}$
57. Express in the simplest form $\sqrt{180}$
58. Simplify $\frac{\sqrt{21}\sqrt{9}}{\sqrt{63}}$
59. Evaluate $\frac{3x^2\sqrt{y}+6}{5(x+y)}$ for $x = -4, y = 9$ (17/II)

60. Express in the simplest form $\sqrt[5]{96 x^6 y^7 z^8}$

61. Simplify $\sqrt[5]{243 x^5 y^{10} z^{15}}$

62. If $x = 4 - \sqrt{17}$, then Find $\frac{1}{x}$ (24/II)

63. Simplify $2(6\sqrt{5} - 3\sqrt{5})$ (17/I)

64. Simplify $(\sqrt{5} + \sqrt{3})(\sqrt{5} - \sqrt{3})$ (22/I)

65. Find the Conjugate. $9 + \sqrt{2}$ (21/I)

66. Find the value value of $x + y + z$ (24/I)

$$x^2 + y^2 + z^2 = 98 \quad xy + yz + zx = 48$$

Unit -5 Factorization

1. What is factorization? Give one example.

2. Factorize $3x - 3a + xy - ay$

3. Factorize $4x^2 - (2y - z)^2$ (22-15 / I)

4. Factorize $3x - 243x^3$ (23/I)

5. Factorize $x^2 - a^2 + 2a - 1$ (24/I) [4 marks]

6. Factorize $12x^2 - 36x + 27$ (2018 / I)

7. Factorize $x(x-1) - y(y-1)$ (19/I)

8. Factorize $144a^2 + 24a + 1$

9. Factorize $1 - 64z^2$ (24/I)

10. Factorize $27 + 8x^3$

11. Factorize $x^2 - 11x - 42$ (II-24/23/II)

12. Factorize $x^2 + 5x - 36$ (19/II)

13. Factorize $4x^4 + 81$

14. If $(x - 1)$ is a factor of $x^3 - kx^2 + 11x - 6$, then find the values of k (17/II)

15. If $(x + 2)$ is a factor of $3x^2 - 4kx - 4k^2$, then find the values of k (23/I)

16. Find the remainder by remainder theorem when $3x^3 - 10x^2 + 13x - 6$ is divided by $(x - 2)$.

17. Define remainder theorem (17/II)

18. Factorize $3x^2 - 75y^2$ (13 / I)

19. Factorize $128am^2 - 242an^2$ (18 / II)

20. Factorize $\left(5x - \frac{1}{x}\right)^2 + 4\left(5x - \frac{1}{x}\right) + 4$ (13 / I)

21. Factorize $1 + 2ab - a^2 - b^2$ (16 / I, 15 / I)

22. Factorize the cubic polynomials by factor theorem (19/II)
 $x^3 - 4x^2 + x + 6$
23. Factorize $8x^3 + 125y^3$ (17-I,15 / I) [2 marks]
24. Use remainder theorem to find remainder ,
 when $3x^3 - 10x^2 + 13x - 6$ is divided by $(x - 2)$ (15/II)
25. Factorize (i) $125x^3 - 216y^3$ (ii) $9x^2 + 21x - 8$ (14 / II) [4 marks]
26. Factorize $a^4 - 4b^4$ (14 / I) [4 marks]
27. Factorize $(x + 1)(x + 2)(x + 3)(x + 4) - 120$ (14 / I) [4 marks]
28. Factorize $5x^2 - 16x - 21$ (16 / II,14 / I) [2 marks]
29. Factorize $8x^2 - 40x + 50$ (24 / I) [2 marks]
30. Factorize $25x^2 + 16x - 40x$ (24 / II)
31. Factorize $1 + 2ab - a^2 - b^2$ (16 / I,15 / II) [2marks]
32. Factorize $x^3 + x^2 - 10x + 8$ (16 / II) [4 marks]
33. Factorize $x^3 - 12x^2 + 48x - 64$ (18/ I) [4 marks]
34. Factorize $x^3 + 60x^2 + 150x + 125$ (18/I I) [4 marks]
35. Factorize $8x^3 - 125y^3 - 60x^2y + 150xy^2$ (21/I) [4 marks]
36. Factorize $25x^2 - 10x + 1 - 36x^2$ (21/II) [4 marks]
37. Factorize $\frac{a^2}{b^2} - 2 + \frac{b^2}{a^2}$ (22/II)
38. Factorize the cubic polynomials by factor theorem
 $x^3 - 2x^2 - x + 2$ (17-I,14/ II)
39. Factorize the cubic polynomials by factor theorem
 $x^3 - 6x^2 + 3x + 10$ (22/I-19/I,17-I,14/ II)
40. Factorize the cubic polynomials by factor theorem
 $x^3 - x^2 - 22x + 40$ (22/ II)
41. Factorize the cubic polynomials by factor theorem
 $x^3 + 5x^2 - 2x - 24$ (23/ I)
35. Factorize $8x^3 - \frac{1}{27y^3}$ (21/ I-II)
42. Factorize the polynomials by factor theorem (24/ II)
 $x^3 - 6x^2 + 3x + 10$

Unit-6 Algebraic Manipulation

1. Define H.C.F (17-I,18/II)
2. Find the H.C.F of the polynomials. $x^2 - 4, x^2 + 4x + 4, 2x^2 + x - 6$ (14/II)
3. Find the H.C.F of the polynomials. $x^2 - 4, x^2 + 4x + 4$ (18/I)
4. Find the H.C.F by factorization. $X^3 - 2x + x, x^2 + 2x - 3, x^2 + 3x - 4$ (24/II)
5. Define L.C.M. (23/II)
6. Find the L.C.M of $p(x) = 12(x^3 - y^3)$ and $q(x) = 8(x^2 - xy^2)$
7. Find the H.C.F of the following expressions. $x^2 + 5x + 6, x^2 - 4x - 12$
8. Find the H.C.F of the following expressions. $18(x^3 - 9x^2 + 8x), 24(x^2 - 3x + 2)$ (21/II)
9. Find the L.C.M of the following expressions. $39x^7 y^3 z$ and $91x^5 y^6 z^7$ (19/I,II)
10. Find the H.C.F of the following expressions. $39x^7 y^3 z$ and $91x^5 y^6 z^7$ (24/I)
11. Find the L.C.M of the following expressions. $102x^2 y z$ and $85x^2 y z$ (17/II)
12. Find the H.C.F by factorization. $8x^4 - 128, 12x^3 - 96$ (24/II)
13. Use factorization to find the square root of the expression $4x^2 - 12xy + 9y^2$ (15/II)
14. Use factorization to find the square root of the expression $x^2 - 1 + 1/4x^2$ (22/I)
15. Define square root of the algebraic expression with example. (16/I)
16. Simplify $\frac{a+b}{a^2-b^2} \div \frac{a^2-ab}{a^2-2ab+b^2}$ (23-15/I)
17. Solve if $A = \frac{a+1}{a-1}$ then find $A - \frac{1}{A}$ (22/II)
18. Find the H.C.F. of $102x^2 y z, 187x^2 y z^2$ (21/I)

Long Question

19. Find the L.C.M by factorization $x^2 - 25x + 100, x^2 - x - 20$ (16/I, 15/I)
20. Use Division method to find the square root of $4x^2 + 12xy + 9y^2 + 16x + 24y + 16$ (18-II, 13/I)
42. Use Division method to find the square root of $9x^4 - 6x^3 + 7x^2 - 2x + 1$ (17/II, 18-I, 15/II)
43. Use Division method to find the HCF of $x^3 + 3x^2 - 16x + 12, x^3 + x^2 - 10x + 8$ (21/II)
21. Use Division method to find the square root of $4 + 25x^2 - 12x - 24x^3 + 16x^4$ (19/I, 19-I, 16/II)
22. If $(x+3)(x-2)$ is the HCF of $P(x) = (x+3)(2x^2 - 3x + k)$ & $q(x) = (x-2)(3x^2 + 7x - L)$ then find the value of K & L (14/I)
23. Find the square root of $(x^2 + \frac{1}{x^2}) + 10(x + \frac{1}{x}) + 27$ (16/I)
24. Find the square root of $\frac{1}{16}x^2 - \frac{1}{12}xy + \frac{1}{36}y^2$ (board)
25. $\frac{x^2}{y^2} - 10\frac{x}{y} + 27 - 10\frac{y}{x} + \frac{y^2}{x^2}$ (22/I)
26. $-\frac{1}{x^2 - 6x + 5}$ (14/II)
27. Simplify $\frac{2y^2 + 7y - 4}{3y^2 - 13y + 4} \div \frac{4y^2 - 1}{6y^2 + y - 1}$ (22/II)
28. Find the square root of $4x^4 + 12x^3 + x^2 - 12x + 4$ (17-I)

29. Use Division method to find the square root of $x^4-10x^3+37x^2-60x+36$ (24/I)

30. find the value of ,“x”for which the expression will become a perfect square

$$9x^4-12x^3+22x^2-13x+12 \quad (23-II)$$

31. For what value of “K” $(x+4)$ is the HCF of $x^2+x-(2k+2)$ and $2x^2+kx-12$ (21-I)

32. find the value of l& m for which the expression will become a perfect square

$$49x^4-70x^3+109x^2+lx+n \quad (23-I)$$

Unit-7 Linear Equations and Inequalities

1. What is the linear equation in one variable. Give examples.

2. Define linear inequality in one variable

(I-24/22/Ii- I/23)

3. Solve $\frac{3}{y-1} - 2 = \frac{3y}{y-1}$, $y \neq 0$

4. Solve the equation $\sqrt{2x-3} - 7 = 0$

(18/I&II, 15/I)

5. Solve the equation $\frac{2}{3}x - \frac{1}{2}x = x + \frac{1}{6}$

(I/21/19/II-4mark)

6. Solve the equation $\frac{5(x-3)}{6} - x = 1 - \frac{x}{9}$

(21/II-4mark)

7. Solve the equation $\sqrt{3x+4} = 2$

(II-24/23-II)

8. Solve the equation $\sqrt[3]{3x+5} = \sqrt[3]{x-1}$

(17/I)

9. equation $\sqrt[3]{2x+3} = \sqrt[3]{x-2}$

(21/II)

10. Solve the equation $\sqrt[3]{2-t} = \sqrt[3]{2t-28}$

(19/I)

11. Write the definition of absolute value of a real number. Give example

12. Write four properties of absolute value.

13. Solve $|8x-3| = |4x+5|$

(13/II)

14. Solve $|3+2x| = |6x-7|$

(17/I, 16/II)

15. Solve $|x+2| - 3 = 5 - |x+2|$

(15/I)

16. Solve for x, $|2x+5| = 11$

(22-23/II-23-21-18/I)

17. Solve for x, $\frac{1}{2}|3x+2| - 4 = 11$

(19/I,II,18/II)

18. Solve for x, $\frac{1}{2}|x+3| + 21 = 9$

(16/II)

19. Define inequalities. Give examples.

20. Solve $9-7x > 19-2x$

21. Solve the inequality $-2 < \frac{1-2x}{3} < 1$

22. Solve the inequality $3x-10 \leq 5 < x+3$

23. Solve for x $|\frac{3-5x}{4}| - \frac{1}{3} = \frac{2}{3}$

(I-

24/13/I)

24. Solve for x $|\frac{x+5}{2-x}| = 6$

(21/II-15/I)

25. Solve the equation $\sqrt{x-3} - 7 = 0$

(I-

24/13/I)

26. Solve the inequality $3x+1 \leq 5x-4$

(/22-13-14/I,14/II.15/II)

27. Solve $\frac{3x-1}{3} - \frac{2x}{x-1} = x$

(13/II)

28. Solve $\frac{3x}{2} - \frac{x-2}{3} = \frac{25}{6}$

(16/I)

29. Solve $\frac{2}{x^2-1} - \frac{1}{x+1} = \frac{1}{x+1}$

(22/II-17/I)

30. Solve $\frac{x}{3x-6} = 2 - \frac{2x}{x-2}$ (21/I-17/II)
31. Solve $x + \frac{1}{3} = 2(x - \frac{2}{3}) - 6x$ (18-II, 16/I)
32. Define extraneous root. (13/II,14/II)
33. Solve for x, $|3x-5| = 4$ (22/I-17/II,14/I)
34. Solve the inequality $-3 < \frac{x-4}{-5} < 4$ (14/I)
35. Solve the equation $\sqrt[3]{2x-4} - 2 = 0$ (17/II)
36. Solve the equation $\frac{x-3}{3} - \frac{x-2}{2} = -1$ (14/II)
37. Solve the equation $\frac{3x+2}{9} - \frac{2x+1}{3} > -1$ (22/I)
38. Solve the inequality $\frac{3x+2}{9} - \frac{2x+1}{3} > -1$ (24/II)
39. Solve the inequality $-5 \leq \frac{4-3x}{2} < 1$ (23/II-23-18/I)
40. What is meant by equivalent equation? (15/II)
41. Solve and check the equation $\sqrt{x+7} + \sqrt{x+2} = \sqrt{6x+13}$ (19/I,15/II)
42. Define radical equation. (16/I)
43. Solve the equation $\sqrt{5x-7} - \sqrt{x+10} = 0$ (19/II,16/II)

Unit-8 Linear Graphs and Their Application

- What is Cartesian plane? (19/ II,14/I,16/I)
- What is an ordered pair of real numbers?
- Define origin. (22-17/II,18/I)
- Check the line $x+2=5$ is parallel to x-axis or y-axis
- Check the line $2x-3y=1$ is parallel to x-axis or y-axis
- Find the value of m and c of the line $3-2x+y=0$ by expressing in the form of $y=mx+c$ (17/I,17/II,16/II)
- Find the value of m and c of the line $2x+3y-1=0$ by expressing in the form of $y=mx+c$ (I-24/19/I,16/I)
- Verify whether the points lies(i) (-1,1)(ii) (2,3) on the line $2x-y+1=0$ or not. (23/I-22/II)
- Verify whether the point lies (2,5) on the line $2x-y+1=0$ or not. (15/II)
- Does the point P (5,3) lie on the line $2x-y+1=0$? (21/II-14/II)
- Draw the graph for the equation $2x+6=0$ (15/II)
- Draw the graph for the equation $x=2$ (14/II)
- Draw the graph of line $x=-4$ (24/I)
- Draw the graph for the equation $y=7$ (23-21/II)
- Draw the graph $y=-1$ (24/II)
- Find the value of m and c by expressing the line $x-2y=-2$ in the form of $y=mx+c$ (23-19/II, 21-13-14/I)
- Plot two points P(2,2) and Q(6,2) on the graph paper and get the line segment. (13/II)
- Plot the given points P(3,2) and Q(6,7) on the graph paper. (17/I)
- Define scale of graph. (13/II)

19. Find the value of m and c of the line $3-2x+y=0$ by Expressing in the form of $y=mx+c$ (18/II)

20. Find the value of m and c of the line $3-4y-5=0$ by

Expressing in the form of $y=mx+c$ (24/II)

21. Draw the points $(-3,-3)$, $(-6,4)$ on the graph paper. (22/I-18/II)

22. Find the value of m and c of the line $3x+y-1=0$ by Expressing in the form of $y=mx+c$ (18/I)

23. The formula of degree Fahrenheit is given by $F=\frac{9}{5}C+32$ if $C=10$ then find F (19/I)

24. Find the value of m and c of the line $2x-y=7$ by expressing in the form of $y=mx+c$ (22/I)

25. Determine the Quadrant in which the points $P(-4,3)$, $Q(-5,-2)$ lies (21/I)

Unit-9 Introduction to Coordinate Geometry

- Let P be the point on x -axis with x -coordinate ' a ' and Q be the point on y -axis with y -coordinate ' b ' as given below. Find the distance between P and Q , $a=-9$, $b=-4$
- What is the coordinate geometry? (15/I)
- Determine the Quadrant in which the points lie? $R(2,2)$ and $S(2,-6)$ (16/II)
- Find the distance between the pairs of points.
 - $A(-4,\sqrt{2})$, $B(-4,-3)$ (14/I)
 - $A(2,-6)$ and $B(3,-6)$. (I-24/15/I)
 - $S(-1,3)$ and $R(3,-2)$. (23/I-22-13/II)
 - $P(1,2)$ and $Q(0,3)$ (16/I)
 - $A(-8,1)$, $B(6,1)$ (II-24/13-18/I, 21-23-19-15/II)
 - $A(9,2)$, $B(7,2)$ (II-24/21/I-16/II)
 - $A(3,-11)$, $B(3,-4)$ (19/I, 16-17-18/II)
- Define coordinate Axis. (15/I)
- What is the distance formula between two points? (13/I, 13/II)
- Write the formula for the Mid-point of two points. (14/I)
- What are collinear points in the plane? (13/I, 15/I)
- What are non-collinear points in the plane? (15/I)
- Use distance formula to verify that the points $A(0,7)$, $B(3,-5)$, $C(-2,15)$ are collinear.
- Find the length of the diameter of the circle having Centre at $C(-3,6)$ and passing through $P(1,3)$.
- Find the mid-point of the line segment joining each of the pairs of points.
 - $A(-4,9)$, $B(-4,-3)$ (23/II-17/I)
 - $A(6,6)$, $B(4,-2)$ (22/I)
 - $A(9,2)$, $B(7,2)$ (19/II)
 - $A(3,-11)$, $B(3,-4)$ (18-II, 16/II)
 - $A(2,-6)$ and $B(3,-6)$. (18/I)
 - $A(-7,-5)$ and $B(-5,-7)$ (14/II)

- vii. A(-7,4) and B(6,-2) (24/I)
- viii. A(-8,1), B(6,1) (24/II)
13. Define Equilateral Triangle ((14-22/I)
14. Define Right angle Triangle. (21-19/I)
15. Define Isosceles Triangle. (13-14-16/I,14/II)
16. Define Scalene Triangle (21-17/II)

Unit-12 Theorems

Theorem 1: prove that any point on the right bisector of the line segment is equidistant from its end points. (II-24/I-21/II-21/19/I)

Theorem 2: Any point equidistant from the end points of a line segment is on the right bisector of it. (14/II.18/I)

Theorem 3: The right bisectors of the sides of a triangle are concurrent.

(I-23/17/II,619/II,13/II,16/I)

Theorem 4: Any point on the bisector of an angle is equidistant from its arms.

(II-23/I-22/II-22/I-21/II-21/17/I,15/I,16/I,18-II)

Theorem 5: Any point inside an angle, equidistant from its arms, is on the bisector of it. (I-24/15/II)

Theorem 6: The bisectors of the angles of a triangle are concurrent. (13/I) (14/I)

Unit-16

Theorem 1: Parallelograms on the same base and between the same parallel lines (or of the same altitude) are equal in area. (I-24/19/I)

Theorem 2: Parallelograms on equal bases and having the same (or equal) altitude are equal in area. (II-22/16/I,15/II,19/II)

Theorem 3: Triangles on equal bases and of equal altitudes are equal in area. (II-24/II-23/23/I)

(II-23/17/I,13/I,14/I,16/I, 18-II)

Theorem 4: Triangles on the same base and of the same (i.e., equal) altitudes are equal in area.

(I-22/13/II,14/II,15/I ,18/I,17/II)

Unit -`17 Practical Geometry (Triangles)

- Construct a right angled triangle measure of whose hypotenuse is 5cm and one side is 3.2cm. [Hint: Angle in a semicircle is a right angle].
- Construct a right angled isosceles triangle whose hypotenuse is 5.2cm long.
- Construct a triangle ABC, in which $m\angle A=3.2\text{cm}$, $m\angle B=4.2\text{cm}$, $m\angle C=5.2\text{cm}$. (22-17-18/I,17/II)
- Construct a triangle ABC, in which $m\angle A=4.8\text{cm}$, $m\angle B=3.7\text{cm}$, $m\angle C=30^\circ$. (15/I)

5. Construct a triangle ABC, in which $m\overline{AB}=4.8\text{cm}$, $m\overline{BC}=3.7\text{cm}$, $m\angle B=60^\circ$. (I-23/19/I,14/II)
6. Construct a triangle ABC, in which $m\overline{BC}=4.2\text{cm}$, $m\overline{CA}=3.5\text{cm}$, $m\angle C=75^\circ$. (16/I)
7. Construct a triangle ABC, in which $m\overline{AB}=3.6\text{cm}$, $m\angle A=75^\circ$, $m\angle B=45^\circ$. (21/II)
8. Construct a triangle XYZ, in which $m\overline{ZY}=2.4\text{cm}$, $m\overline{ZX}=6.4\text{cm}$ and $m\angle Y=90^\circ$. (21/I)
9. Construct a triangle XYZ, in which $m\overline{ZY}=7.5\text{ cm}$, $m\overline{ZX}=6\text{ cm}$ and $m\angle Y=90^\circ$. (24/I)
10. Construct a right angled isosceles triangle whose hypotenuse is 4.8cm long.
11. Define Incentre. (23/I)
12. Define right bisector of a line segment. (22-18-14/II)
13. Define Circumcentre. (22-21/I, 21-16/II)
14. Define Orthocenter. (22-21-17-19/I,14/II)
15. Define Centroid of the triangle. (I-24/18/I,18-II,15/II,16/I)
16. Define point on concurrency. (23/II)
17. Define concurrent lines.
18. Construct triangle ABC, in which $m\overline{AB}=3\text{cm}$, $m\overline{AC}=3.2\text{cm}$, $m\angle A=45^\circ$. (19/II,18-II,13/I,13/II)
19. What is meant by bisector of an angle and draw the diagram? (17/I,18/I,13/I,15/I,16/II)
20. Construct a triangle XYZ, in which $m\overline{YZ}=7.6\text{cm}$, $m\overline{XY}=6.1\text{cm}$ and $m\angle X=90^\circ$. (13/I,22-16/II)

Long questions:

1. Construct the following triangle PQR. Draw its altitudes and show that they are concurrent.
 $m\overline{QR}=4.5\text{cm}$ $m\overline{PQ}=6\text{cm}$ and $m\overline{PR}=5.5\text{cm}$ (19/II,13/I,15/I)
2. Construct the following triangle ABC. Draw its perpendicular bisectors of the side and show that they are concurrent.
 $m\overline{AB}=5.3\text{cm}$ $m\angle A=45^\circ$ and $m\angle B=30^\circ$ (14/I,15/II)
3. Construct the following $\triangle XYZ$. Draw its three medians and show that they are concurrent.
 $m\angle Y=60^\circ$, $m\overline{YZ} = 4.1\text{cm}$, $m\angle X=75^\circ$. (16/I)
4. Construct the following triangle ABC. Draw its bisectors of the angle and show that they are concurrent.
 $m\overline{AB}=4.5\text{cm}$ $m\overline{BC}=3.1\text{cm}$ and $m\overline{AC}=5.2\text{cm}$. (17/I,19/I,14/I,16/II)
5. Construct the following triangle ABC. Draw its perpendicular bisectors of the side and show that they are concurrent.
 $m\overline{AB}=4.5\text{cm}$ $m\overline{BC}=3.1\text{cm}$ and $m\overline{AC}=5.2\text{cm}$. (14/I)
6. Construct the following triangle ABC. Draw its bisectors of the angles and show that they are concurrent.
 $m\overline{AB}=4.2\text{cm}$ $m\overline{BC}=6\text{cm}$ and $m\overline{AC}=5.2\text{cm}$. (24-21/18-II, 14)
7. Construct the following triangle ABC. Draw its perpendicular bisectors of the side and show that they are concurrent.
 $m\overline{AB}=4\text{cm}$ $m\overline{BC}=4.8\text{cm}$ and $m\overline{AC}=3.6\text{cm}$. (17/II,13/I)
8. Construct the following $\triangle PQR$. Draw its altitudes and show that they are concurrent.

$m\angle Q=30^\circ$, $m\overline{RP} = 3.6\text{cm}$, $m\angle P=105^\circ$. (18/I)

9. Construct the following $\triangle XYZ$. Draw its three **medians**.

$m\overline{XY}=4.5\text{cm}$, $m\overline{YZ} = 3.4\text{cm}$, $m\overline{ZX}=5.6\text{cm}$ (I-22/II-23/II-22/ 21/I)

10. Construct the following triangle ABC. Draw its **bisectors** of the angles. (23/I)

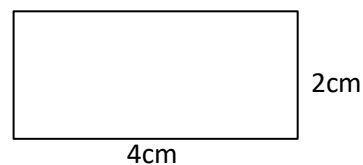
$m\overline{AB}=3.6\text{cm}$ $m\overline{BC}=4.2\text{cm}$ and $m\angle B=75^\circ$

11. 11. Construct the following triangle ABC. Draw its **bisectors** of the angle verify their concurrency.

$m\overline{AB}=4.5\text{cm}$ $m\overline{BC}=3.1\text{cm}$ and $m\overline{AC}=5.2\text{cm}$. (24/I)

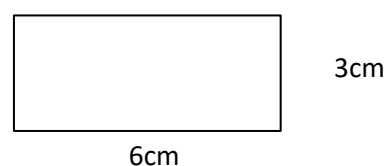
Unit-10 -16 (Geometry) Short questions:

1. What is the congruency of two triangles? (14/I,14/II,15/I,16/I,16/II)
2. What is a parallelogram? (I-24/I-23/23-17/I,22-17-18-16/II)
3. In a parallelogram ABCD, $m\overline{AB} = 10\text{cm}$. The altitudes corresponding to sides AB and AD are respectively 7cm and 8cm. find AD.
4. Define Area of a figure. (17/II)
5. Define triangular region. (21-16/I)
6. Define point of concurrency (24/II)
7. Define median of triangle (23/II)
8. by What is meant point of trisection (23/II)
9. Define square region. (15/II)
10. Define rectangular region. (I-24/18-14-15/I, 13-18-21-14/II)
11. Define triangle. (14/II)
12. Define congruent triangles. (17/II,19/I,18-II,15/I)
13. What a triangle is called if two sides are congruent? (15/II)
14. Define altitude or height of a triangle. (22-18-13/I,22-19-16/II)
15. What is meant by interior of rectangle (24/II)
16. Define the altitude of a parallelogram.
17. State the congruent area axiom. (19/I)
18. When does the area of parallelogram and rectangle equal
19. Find the area of the given figure. (24/II)



20. Find the area of the given figure.

(II-21,17/I,19/II ,14/II)



21. If 3cm and 4cm are the two sides of a right-angled triangle then what should be the third side of the triangle? (22-17-18-15/I,16/II)
22. If two angles of a triangle are of 35° and 85° , then find the third angle.
23. If one angle of a right angle triangle is of 45° , then find third angle.
24. If one angle of a parallelogram is of 130° , then find the measure of its remaining angles. (17/I, 19/II)
25. What are you meant by $H.S \cong H.S$? (19/II,14/II,15/II)
26. What are you meant by $S.A.A \cong S.A.A$? (I-23/22/II)
27. What will be the angle for shortest distance from an outside point to the line? (21/I)
28. How many parts are there of a theorem? Name them. (15/II)
29. Write difference between ratio and proportion. (19/I)
30. If two angles of a triangle are 90° and 60° , then what will be the value of the third angle? (16/I)
31. How many Mid-points line segment have? (15/II)
32. Define complementary angles. (15/II)
33. If $a^2+b^2 < c^2$ then what kind of triangle it is? (15/II)
34. Write the name of these symbols \cong and \leftrightarrow (23/I)
35. If two angles of a triangle are un equal in measure, how will be the length of their opposite sides. (13/I)
36. Define the ratio between two alike quantities. (21-13-14-15-16/I, 14-16/II)
37. Define S.A.S postulate. (II-24/23-17/II,14/I)
38. Define S.S.S postulate (18/I,18/II)
39. What are similar triangles? (22-17/I, 17/II,16/I)
40. Differentiate between area and region of a triangle. (15/I)
41. Define bisector of an angle. (17/II,19/I,14/I)
42. State congruent area Axiom. (19/I)
43. Define square. (14/I)
44. Write the symbols of congruent and similar. (24/I)
45. Define Interior of Triangle. (/17/II,19/II)
46. Verify that measures of sides are right-angle or not $a=9\text{cm}$, $b= 12\text{cm}$ and $c= 15\text{cm}$ (24/II)
47. 3cm, 4cm and 7cm are not the lengths of the triangle. Prove it OR give reason. (17/II,18-II,14/I,16/I)
48. Which of the following sets of length can be the length of the side of the triangle.
 (i) 2cm, 4cm and 7cm (ii) 3cm, 4cm, 5cm
49. State Pythagoras theorem. (22-13/I,23-22-13-14-16-17/II)
50. State the converse of Pythagoras theorem (23/I)
51. Describe the practical application of similar triangle. (II-24/24/I)
52. Verify 3cm, 4cm and 5cm are the length of sides of triangle. (23-22/II)
53. Write down the formula of Pythagoras theorem. (18/I)
54. Define proportion. (18/I,23-22-21-13/II)
55. If 13cm, 12cm and 5cm are the lengths of the triangle then verify that difference of measure of any two sides of a triangle is less than the third side. (23/I)
56. Verify that 10cm, 6cm and 8cm are the length of sides of triangle. (24/I)

57. If 10cm, 6cm and 8cm are the lengths of the triangle then verify the sum of measure of two sides of a triangle is greater than the third side. (21-19/II)

58. Verify that triangle having given measures of sides is right-angled?

$a=5\text{cm}$, $b=12\text{cm}$ and $c=13\text{cm}$.

(21-13/I, 22-18-14/II)

59. Verify that triangle having given measures of sides is right-angled?

$a=1.5\text{cm}$, $b=2\text{cm}$ and $c=2.5\text{cm}$.

(15/I)

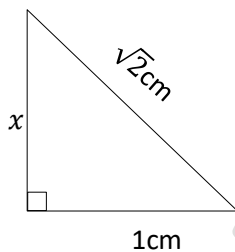
58. Verify that 2cm, 4cm and 7cm are the lengths of triangle or not? Give reason (24/II)

60. Find the unknown value of x in the given figure. (I-24/23-14-15/II, 23-15-14/I)

61. Verify that triangle having given measures of sides is right-angled? (24/I)

$a=6\text{cm}$, $b=4\text{cm}$ and $c=2\sqrt{13}\text{cm}$

62. Find value of x



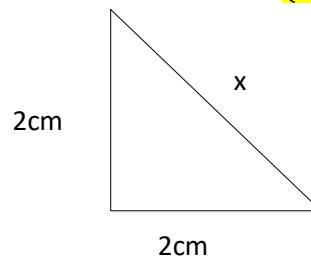
63. Verify that triangle having given measures of sides is right-angled?

$a=9\text{cm}$, $b=12\text{cm}$ and $c=15\text{cm}$.

(19/II, 13/II)

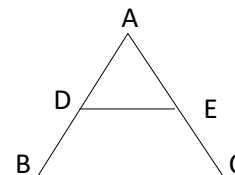
64. Find the unknown value x in the figure

(24/II)

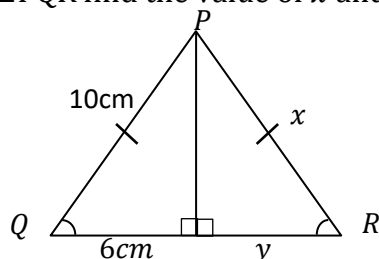


65. In a triangle ABC $\overline{DE} \parallel \overline{BC}$ if $\frac{AD}{DB} = \frac{3}{5}$ and $AC=4.8\text{cm}$ then find mAE.

(16/II)

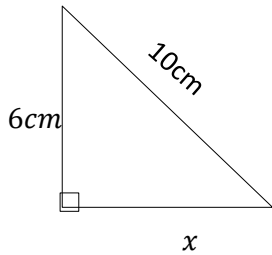


66. In isosceles $\triangle PQR$ find the value of x and y .

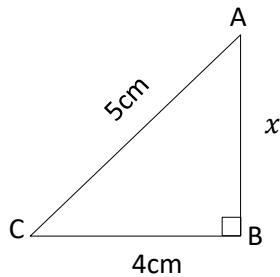


67. Find the unknown value of x in the given figure.

(18/I, 19/II, 16/I, 14/II)



68. In triangle ABC find the value of x .



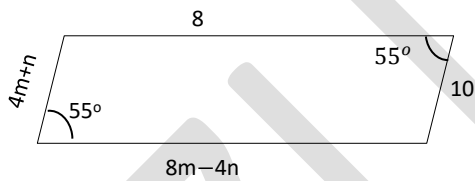
69. Verify that triangle having given measures of sides is right-angled?

$a=16\text{cm}$, $b=30\text{cm}$ and $c=34\text{cm}$.

(21/II, 17-19-14/I)

70. Find the values of 'm' and 'n' in the parallelogram below.

(15/II, 22-15/I)



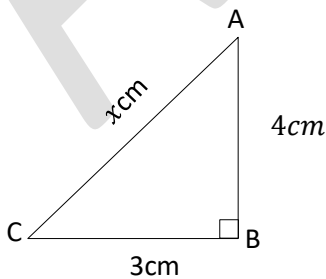
71. Find the values of 'm' and 'x' in the parallelogram below.

(II-24/I-23/22-14/II)



72. In triangle ABC find the value of x .

(21/I, 16-17/II)

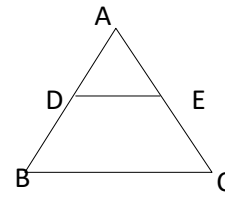


73. Find the unknown values in the parallelogram below.

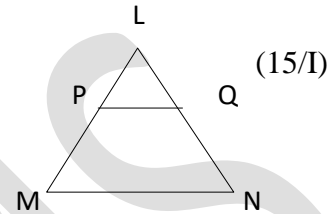
(16/II) (13/I)



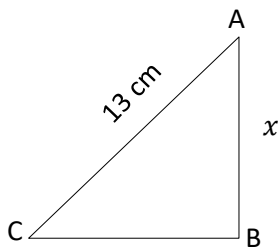
74. If $\overline{AD} = 2.4\text{cm}$, $\overline{AE} = 3.2\text{cm}$, $\overline{DE} = 4.8\text{cm}$, then find \overline{BC} .



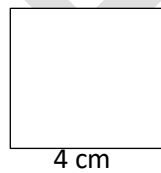
75. If $m\overline{LM} = 6\text{cm}$, $m\overline{LQ} = 2.5\text{cm}$, $\overline{QN} = 5\text{cm}$, then find \overline{LP} .



76. In triangle ABC find the value of x . (II-21,19/I, 18/II)



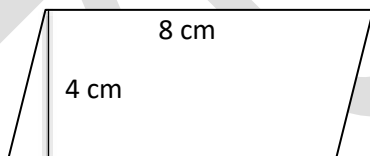
77. Find the area of the figure.



(23-18/I & II)

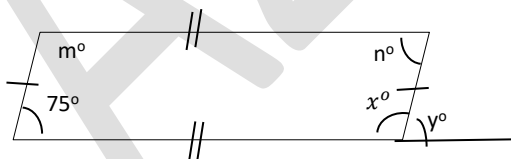
78. Find the area of the given figure.

(23/II,19/I)



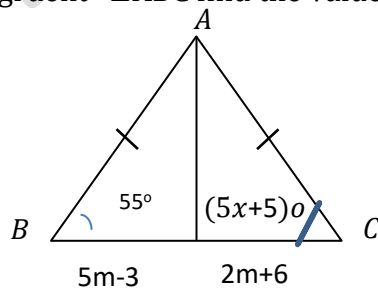
79. Find the unknown the values given in the figure

(21/II, 21-19/I)

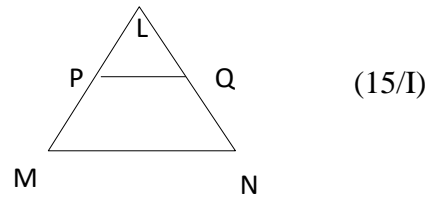


80. In given congruent $\triangle ABC$ find the value of x and m .

(21/II, 22-19/I)



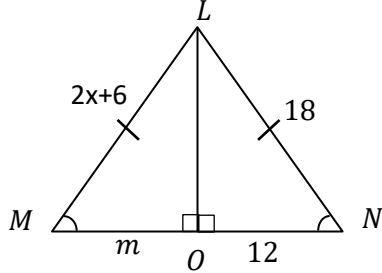
81. If $m\overline{LM} = 5\text{cm}$, $m\overline{LP} = 2.5\text{cm}$, $\overline{LQ} = 2.3\text{cm}$,
then find \overline{LN} .
(MN is parallel to PQ)



(15/I)

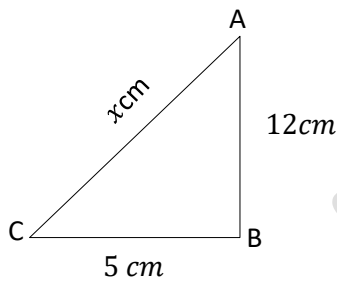
82. In given congruent $\triangle LMO$ and $\triangle LNO$ find the value of x and m .

(22/I, 19/II)



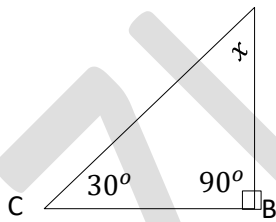
83. Find the value of x .

(17/I)



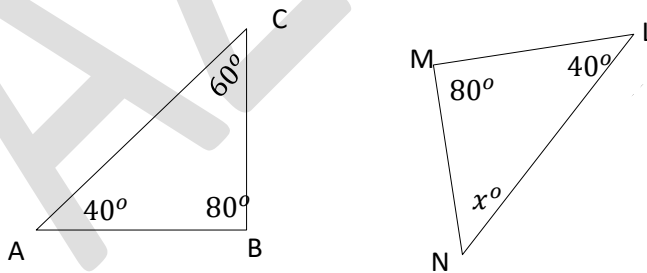
84. Find the value of x .

(17/I)



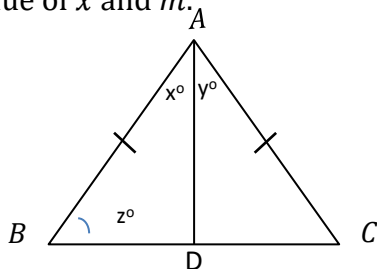
85. If $\triangle ABC \cong \triangle LMN$ then Find the value of x .

(21/I)



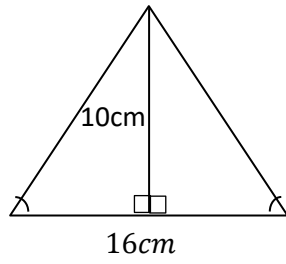
86. In given $\triangle ABC$ is equilateral triangle and AD is bisector of an angle A, then find the value of x and m .

(24II, 21/I)



87. Find the area of figure

(I-24/21-22/II)



88. IF CD is the right bisector of the line segment AB then

(23/II)

- i). $m \angle O A = \dots\dots\dots$
- ii). $m \angle A Q = \dots\dots\dots$

