Chapter # 1

1. If

$$A = \begin{bmatrix} 2 & 3 \\ 1 & 0 \end{bmatrix}, \quad B = \begin{bmatrix} 5 & -4 \\ -2 & -1 \end{bmatrix}$$

then find $2A + 3B$.

2. If

$$A = \begin{bmatrix} 3 & 0 \\ -1 & 2 \end{bmatrix}, \quad B = \begin{bmatrix} 6 \\ 5 \end{bmatrix}$$

then find AB.

3. Find the transpose of the matrix

$$D = \begin{bmatrix} 2 & 3 \\ 0 & 5 \end{bmatrix}$$

4. Check whether the matrix

$$D = \begin{bmatrix} 5 & -10 \\ -2 & 4 \end{bmatrix}$$

is singular or non-singular.

5. If

$$B = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$$

then find

$$B \cdot \begin{bmatrix} -2 \\ 3 \end{bmatrix}$$

6. Find the product:

$$\begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} 4 \\ 0 \end{bmatrix}$$

7. Verify that the matrix

$$A = \begin{bmatrix} 3 & 6 \\ 2 & 4 \end{bmatrix}$$

is a singular matrix.

8. If

$$A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}, \quad B = \begin{bmatrix} 0 & 7 \\ -3 & 8 \end{bmatrix}$$

then find $2A^t - 3B^t$.

9. If

$$A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$$

then verify that $(A^t)^t = A$.

10. If

$$A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}, \quad B = \begin{bmatrix} 0 & 7 \\ -3 & 8 \end{bmatrix}$$

then find $3A - 2B$.

11. Find the product:

$$\begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} 5 \\ -4 \end{bmatrix}$$

12. Find a and b if:

$$\begin{bmatrix} a+3 & 4 \\ 6 & b-1 \end{bmatrix} = \begin{bmatrix} -3 & 4 \\ 6 & 2 \end{bmatrix}$$

Chapter # 2

1. Simplify:

$$\frac{4(3)^n}{3^{n+1} - 3^n}$$

2. Simplify:

$$\sqrt[4]{81y^{-12}x^{-8}}$$

3. Simplify:

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

4. Simplify:

$$\sqrt[3]{\frac{-8}{27}}$$

5. Simplify and write the answer in $a + bi$ form:

$$\frac{-2}{1 + i}$$

6. Simplify:

$$\sqrt[3]{-125}$$

7. Simplify:

$$(x^3)^2 \div x^2$$

8. Write in $a + ib$ form:

$$(\sqrt{5} - 3i)^2$$

9. Simplify:

$$\sqrt{25x^{10}y^{8m}}$$

10. Simplify:

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

11. Find the value of x and y:

$$x + iy + 1 = 4 - 3i$$

12. Simplify:

$$5^3 \div (5^2)^3$$

13. Simplify:

$$\sqrt[3]{16x^4y^5}$$

14. Give a rational number between $\frac{3}{4}$ and $\frac{5}{9}$.

15. Simplify:

$$(2x^5y^{-4})(-8x^{-3}y^2)$$

16. Simplify:

$$\sqrt{21} \times \sqrt{7} \times \sqrt{3}$$

17. Express each complex number in the standard form $a + bi$, where a and b are real numbers:

$$(2 + 3i) + (7 - 2i)$$

18. Simplify:

$$(2 - 3i)(3 - 2i)$$

19. Evaluate:

$$(-i)^5$$

20. Simplify:

$$\sqrt[5]{\frac{3}{32}}$$

21. Express

$$\frac{1}{1 + 2i}$$

Chapter # 3

1. Calculate:

$$\log_3 2 \times \log_2 81$$

2. Find the value of x:

$$\log x = 0.00443$$

3. Find the value of x:

$$\log_3 x = 4$$

4. Find the value of x:

$$\log x = 0.1821$$

5. Evaluate:

$$\log_2 \frac{1}{128}$$

6. Write into logarithm sum or difference:

$$\log \frac{21 \times 5}{8}$$

7. Write in the form of a single logarithm:

$$2 \log x - 3 \log y$$

8. Find the value of x when:

$$\log_{64} 4 = 2$$

9. Find the value of x:

$$\log_{64} x = \frac{x}{2}$$

10. If $\log 2 = 0.3010$ and $\log 3 = 0.4771$, then find $\log 243$.

11. Write in the term of a single logarithm:

$$\log 5 + \log 6 - \log 23$$

12. Find the value of x:

$$x \log_{64} 8 = \frac{x}{2}$$

13. Find the value of x, if:

$$\log_{81} 9 = x$$

14. Calculate:

$$\log_5 3 \times \log_3 25$$

15. Write 416.9 in the form of scientific notation.

16. If $\log 2 = 0.3010$, $\log 3 = 0.4771$, and $\log 5 = 0.6990$, then find the value of $\log 30$.

17. If $\log 2 = 0.3010$, $\log 3 = 0.4771$, and $\log 5 = 0.6990$, then find $\log 24$.

18. Write in ordinary form:

$$9.018 \times 10^{-6}$$

19. Find the value of x:

$$\log_{625} 5 = \frac{1}{4}x$$

20. Evaluate:

$$\log_2 x = 5$$

21. Express in scientific notation:

$$0.0074$$

22. Find the value of a, if:

$$\log_a 6 = 0.5$$

Chapter # 4

1. If $a + b = 10$ and $a - b = 6$, then find the value of $a^2 + b^2$.

2. Reduce to the lowest form:

$$\frac{8a(x + 1)}{2(x - 1)}$$

3. Simplify:

$$\frac{4}{5}\sqrt{125y}$$

4. Reduce the rational expression to the lowest form:

$$\frac{120x^2 y^3 z^5}{30x^3 y^2 z}$$

5. If $x = 2 - \sqrt{3}$, then find $\frac{1}{x}$.

6. Simplify:

$$\left(\sqrt{2} + \frac{1}{\sqrt{3}}\right)\left(\sqrt{2} - \frac{1}{\sqrt{3}}\right)$$

7. Evaluate the value of

$$\frac{x^{2y} - z^2}{xz}$$

when $x = 3$, $y = -1$, $z = -2$.

8. If $x = 2 - \sqrt{3}$, then find $\frac{1}{x}$.

9. Simplify:

$$(3 + \sqrt{3})(3 - \sqrt{3})$$

10. If $x = \sqrt{3} + 2$, then find $x + \frac{1}{x}$.

11. Reduce the following rational expression to the lowest form:

$$\frac{(x + y)^2 - 4xy}{(x - y)^2}$$

12. Simplify:

$$\frac{5x + 2}{x + 7} \div (x^2 - 49)$$

13. Simplify:

$$\sqrt{3}(2\sqrt{3} + 3\sqrt{3})$$

14. Rationalize the denominator:

$$\frac{15}{\sqrt{31} - 4}$$

15. If $x = \sqrt{3} + 2$, then find the value of $x + \frac{1}{x}$.

16. Evaluate $\frac{x^{3y} - 2z}{xz}$ if $x = -1$, $y = -9$, $z = 4$.

17. If $a + b = 7$ and $a - b = 3$, then find the value of ab.

18. Evaluate $\frac{x^{3y} - 2z}{xz}$ for $x = 3$, $y = -1$, $z = -2$.

19. Express in the simplest form: $\frac{3}{4}\sqrt{128}$.

20. Rationalize the denominator: $\frac{2}{\sqrt{5} - \sqrt{3}}$.

21. Simplify: $\frac{4}{5}\sqrt{125}$.

22. Reduce to the lowest form: $\frac{(x+2)(x^2-1)}{(x+1)(x^2-4)}$.

23. Simplify: $(\sqrt{5} + \sqrt{3})^x$.

24. If $a + b = 5$ and $-b = \sqrt{17}$, then find the value of ab.

Chapter 5

1. Factorize: $125x^3 - 216y^3$.

2. Factorize: $x^2 - 11x - 42$.

3. Factorize: $4x^2 - 16y^2$.

4. Factorize: $144a^2 + 24a + 15$.

5. Find the remainder if $3x^3 - 10x^2 + 13x - 6$ is divided by $(x - 2)$.

6. Factorize: $3x - 243x^3$.

7. Factorize: $25x^2 + 16 + 40x$.

8. Factorize: $x^2 + 8x + 16 - 4y^2$.

9. Factorize: $x^2 + 5x - 365$.

10. Factorize **$128am^2 - 242an^2$**

11. Factorize **$2y^2 + 5y - 35$**

12. Factorize **$x^2 + 14x + 48$**

13. Factorize **$3x^2 - 75y^25$**

14. Factorize **$3x - 243x^3$**

15.)Factorize **$x^2 - 11x - 42\sqrt{2}$**

Chapter 6

1. Use factorization to find the square root of: $4x^2 - 12x + 9y^2$

2. Find the L.C.M: $39x^7y^3z$, $91x^5y^6z^7$

3. Find H.C.F of the given expressions: $x^2 + 5x + 6$, $x^2 - 4x - 12$

4. Find H.C.F of the given expressions: $x^2 + 5x + 6$, $x^2 - 4x - 12$

5. Find the square root using factorization: $(1/16)x^2 - (1/12)xy + (1/36)y^2$

6. Use factorization to find the square root of: $x^2 - 1 + (1/4x^2)$

7. Find L.C.M. of $102xy^2z$, $85x^2yz$, $187xyz^2$

Chapter 7

1. Solve the equation: $\sqrt[3]{2x} - 4 - 2 = 0$

2. Solve the inequality: $4x - 10.3 \leq 21x - 1.8$

3. Solve: $-(1/3)x + 5 \leq 17$

4. Solve the equation: $(x - 3)/3 - (x - 2)/2 = -1$

5. Solve the inequality: $9 - 7x > 19 - 2x, x \in R >$

6. Find the distance between given points: $A(-8,1), B(6,1)$

7. Solve for x: $|3x - 5| = 4$

8. Solve the equation: $(3x/2) - (x - 2)/3 = 25/6$

9. Solve the equation: $(x - 3)/3 - (x - 2)/2 = -1$

10. Solve the equation: $\sqrt[3]{3x} + 4 = 2$

11. Solve the equation: $\sqrt[3]{3x} + 5 = \sqrt[3]{x} - 17$

12. Find the value of x: $|2x + 5| = 11$

13. Solve the radical equation: $\sqrt{2t} + 4 = \sqrt{t} - 1$

Chapter 8

1. Find the value of "F" at C = 10 when $F = (9/5)C + 328$

2. Write the given equation in the form $y = mx + c$, $x - 2y = -2$

3. Write the given equation in the form $y = mx + c$, $3 - 2x + y = 0$

4. Draw the point (4, -5) on the graph paper.

5. Find the value of **m** and **c** of the line $2x + 3y - 1 = 0$ in the form $y = mx + c$.

6. Draw the graph: $x = -6$

7. Verify whether the point (5,3) lies on the line $2x - y + 1 = 0$ or not.

8. Draw the graph of $x = 2$.

9. Find the value of **m** and **c** of the line by expressing in the form $y = mx + c$, $2x + 3y - 1 = 0$

10. Find the value of **m** and **c** by expressing $y + 3x - 2 = 0$ in the form $y = mx + c$

11. Draw the graph of $y = -1$

12. Find the value of **m** and **c** of the line $2x + y + 3 = 1$ in the form $y = mx + c$

13. Draw the graph of $x = 2$ and $x = -3$

14. Draw the graph of the following: $y = 2x + 1$

15. Verify whether the points (-1,1) lie on the line $2x - y + 1 = 0$ or not.

16. Draw the points on graph paper **(-6,4)**.

17. Find the value of **c**, **c = (5/9)(F - 32)** if **F = 176°**.

18. Find the value of **c**, if **c = (5/9)(F - 32)** and **F = 68°**.

19. Verify whether the points (-1,1) lie on the line $2x - y + 1 = 0$ or not.

Chapter 9

1. Find the distance between two points: **A(-4, √2), B(-4, -3)**

2. Find the distance between two points: **A(3, -11), B(3, -4)**

3. Find the distance between two points: **A(3, -11), B(3, -4)**

4. Find the distance between two points: **A(9,2), B(7,2)**

5. Find the mid-point of the line segment joining the pairs of points: **A(2, -6), B(3, -6)**

6. Find the mid-point of the line segment for each of the following pairs of points: **A(-4,9), B(-4,-3)**

7. Find the mid-point between the following pairs of points: **(8,0), (0,-12)**

8. Find the mid-point of the points: **A(6,6), B(4,-2)**

9. Find the mid-point between two points: **A(0,0), B(0,-5)**

10. Find the distance between two points if **S(-1,3), R(3,-2)**

11. Find the mid-point of the line joining two points **A(9,2), (7,2)**

Chapter 10

1. One exterior angle formed on producing one side of a parallelogram is 40°. Find measures of its interior angles.

2. If one angle of a parallelogram is 130°, find the measures of its remaining angles.

3. Find the remaining angles if the sum of the opposite angles of the parallelogram is 110°.

4. Find x° and y° in the given figure.

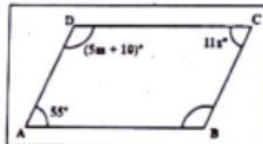*(Diagram included in the image)*
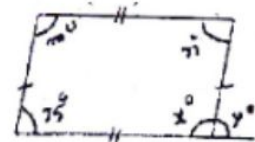
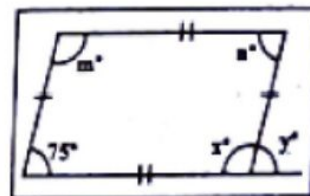5. The given figure LMNP is a parallelogram. Find the value of m and n.

(Diagram included in the image)
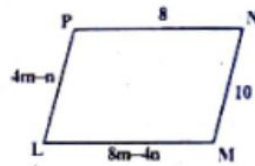
6. Find *m* from the given parallelogram.

(Diagram included in the image)

7. Find the unknown values of x°, y°, m°, n° in the given figure.

(Diagram included in the image)

Question No. 4

Chapter 12 to 17

1. Verify that the triangle having the following measures of sides are right-angled:

   a = 5 cm, b = 12 cm, c = 13 cm

2. Construct a △**ABC**, in which:
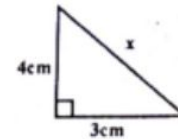
   mAB = 4.8 cm, mBC = 3.7 cm, m∠B = 60°

3. **3 cm, 4 cm, and 7 cm are not the lengths of a triangle. Give reason.**

4. Find the value of **x**:

   (Diagram included in the image)

5. Construct a △**XYZ**, in which:

   mXY = 5.5 cm, mZX = 4.5 cm, m∠Z = 90°

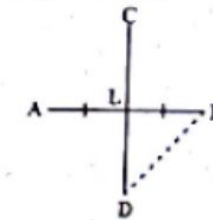6. Verify that **3 cm, 4 cm, and 5 cm** are lengths of sides of a triangle.

7. The three sides of a triangle are **8, x, and 17** respectively. For what value of **x** will it become the base of a right-angled triangle?

8. Construct triangle **ABC**, in which:

   mAB = 3.2 cm, mBC = 4.2 cm, mCA = 5.2 cm

9. In the given figure, **CD** is the right bisector of the line segment **AB**. If **mAB = 6 cm**, find **mAL**
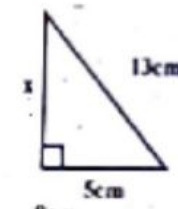
   (Diagram included in the image)

10. **3 cm, 4 cm, and 7 cm are not the lengths of a triangle. Give reason.**

11. Find the unknown value in the given figure.

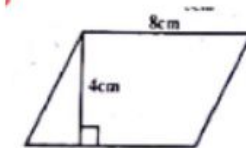   (Diagram included in the image)

12. Verify that **a = 16 cm, b = 30 cm, and c = 34 cm** are sides of a right-angled triangle.

13. Construct triangle **ABC**, in which:

    mAB = 4.2 cm, mBC = 3.9 cm, mCA = 3.6 cm
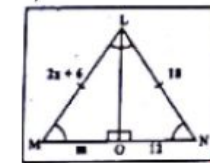
14. Find the area of the given figure.

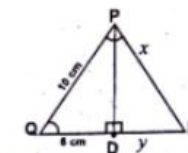   (Diagram included in the image)

15. In the given congruent triangles **LMO** and **LNO**, find the unknown **x**.

    (Diagram included in the image)

16. In isosceles triangle **PQR** shown in the figure, find the value of **x** and **y**.

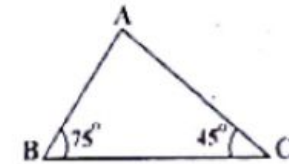   (Diagram included in the image)

17. Verify that **a = 1.5 cm, b = 2 cm, and c = 2.5 cm** are sides of a right triangle.
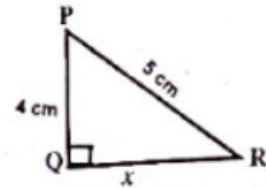
18. In triangle **ABC**, which side is the largest?
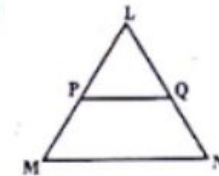
    (Diagram included in the image)

19. Find the value of **x** in triangle **PQR**.

    (Diagram included in the image)

20. In triangle **LMN**, **MN || PQ**, if **mLM = 6 cm, mQN = 5 cm, and mLQ = 2.5 cm**, construct triangle **ABC** in which: **2.5 cm**, then find **mLP**.

    (Diagram included in the image)

21. In triangle **ABC**, **DE || BC**, if **mAD / mDB = 3 / 5** and **mAC = 4.8 cm**, then find **mAE**.
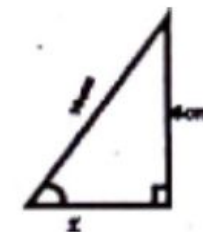
    (Diagram included in the image)

22. Construct triangle **ABC**, in which:

    mAB = 3 cm, mAC = 3.2 cm, and m∠A = 45°

    (Diagram included in the image)

23. Find the value of **x**.

    (Diagram included in the image)

Most Important Definitions

1. What is meant by adjoint of a matrix?

2. Define altitude of a triangle.

3. Define area of a figure.

4. Define bisector of an angle.

5. Define Cartesian plane.

6. Define centroid of a triangle.

7. Define congruency of triangles.

8. Define coordinate axis.

9. Define decadic logarithm.

10. Define equilateral triangle.

11. Define H.C.F.

12. Define height of the parallelogram.

13. Define identity matrix.

14. Define incentre of a triangle.

15. Define incentre of the triangle.

16. Define linear equation and give an example.

17. Define linear inequality and write the standard form.

18. Define natural logarithm.

19. Define non-strict inequalities.

20. Define origin.

21. Define ortho centre.

22. Define parallelogram.

23. Define point of concurrency.

24. Define Pythagoras theorem.

25. Define ratio.

26. Define rectangular matrix and give an example.

27. Define rectangular region.

28. Define right angle triangle?

29. Define right bisector of a line segment.

30. Define similar triangles.

31. Define singular matrix.

32. Define strict inequalities.

33. Define symmetric matrix.

34. Define bisector of a line segment.

35. Define triangular region.

36. Describe converse of Pythagoras theorem.

37. Describe Pythagoras theorem.

38. State congruent area axiom.

Most Important Long Questions

1. Solve the equation with the help of the matrix inverse method:

   $3x - 4y = 4, x + 2y = 8$

2. Simplify:

$$\left(\frac{a^{2l}}{a^{l+m}} \times \frac{a^{2m}}{a^{m+n}} \times \frac{a^{2n}}{a^{n+1}} \right)^2$$

3. Solve the equation with the help of the matrix inverse method:

   $4x + 2y = 8, 3x - y = -11$

4. Simplify:

$$\frac{(81^t) \times 3^5 - (3)^{4t-1} - (243)}{(92^t)(3^3)}$$

5. If

$$B = \begin{bmatrix} 3 & -1 \\ 2 & -2 \end{bmatrix}$$

   then prove that $BB^{-1} = 1$

6. Simplify:

$$\frac{(216)^{2/8} \times (25)^{1/2}}{\sqrt{(04)^{-1/2}}}$$

7. Solve by the matrix inversion method:

   $2x + y = 3, 6x + 5y = 1$

8. Simplify:

$$\left(\frac{a^p}{a^q} \right)^{p+q} \times \left(\frac{a^q}{a^r} \right)^{q+r} + 5(pq + qr + rp), \quad a \neq 0$$

9. Solve by using Cramer's rule:

   $2x - 2y = 4, -5x - 2 = 3y$

10. Solve the equation with the help of Cramer's rule:

    $2x - 2y = 4, 3x + 2y = 6$

11. Simplify:

$$\frac{1}{25k} \times \left(\frac{27}{180} \right)^3 \times \left(\frac{60}{4} \right)^2 \div (9^{3/4})$$

12. Solve the equation with the help of Cramer's rule:

$4x + 2y = 8, 3x - y = -1$

13. Show that:

$$\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a} = 12$$

14. If

$$A = \begin{bmatrix} -1 & 3 \\ 2 & 0 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & -3 \\ 2 & 5 \end{bmatrix}$$

then prove that $B^t A^t = (AB)^t$.

15. Solve by matrix inversion method:

$3x - 2y = -6, 5x - 2y = -10$

16. Solve by using the Cramer's rule:

$4x + y = 9, -3x - y = -5$

Question No. 6 (Chapter 3 + 4)

1. Use logarithm table to find the value of:

$$\sqrt[5]{2.709} \times \sqrt[7]{1.239}$$

2. If $a + b + c = 7$ and $ab + bc + ca = 9$, then find the value of $a^2 + b^2 + c^2$.

3. Use logarithm table to find the value of:

$$0.8176 \times 13.64$$

4. If $x^2 + y^2 + z^2 = 78$ and $xy + yz + zx = 59$, then find the value of $x + y + z$.

5. If $5x - 6y = 13$ and $6x - 5y = 6$, then find the value of $125x^3 - 216y^3$.

6. Use logarithm table to find the value of:

$$0.678 \times 897.3$$

7. If $m + n + p = 10$ and $mn + np + mp = 27$, then find the value of $m^2 + n^2 + p^2$.

8. Use logarithm to find the value of:

$$\frac{(438)^3 \times 0.056}{(388)^4}$$

9. If $x - y = 4$ and $xy = 21$, then find the value of $x^3 - y^3$.

10. Use logarithm to find the value of:

$$\frac{(8.97)^3 \times (3.95)^2}{\sqrt{1.537}}$$

11. If $x + \frac{1}{x} = 3$, then find the value of $x^3 + \frac{1}{x^3}$.

12. Use logarithm to find the value of:

$$\sqrt{2.709} \times \sqrt[7]{1.239}$$

13. If $a^2 + b^2 + c^2 = 45$ and $a + b + c = -1$, then find the value of $ab + bc + ac$.

14. If $p = 2 + \sqrt{3}$, find the value of $p^2 - \frac{1}{p^2}$.

15. Use logarithm to find the value of:

$$(789.5)^{\frac{3}{2}}$$

16. If $x + y = 7$ and $xy = 12$, then find the value of $x^3 + y^3$.

17. If $q = \sqrt{5} + 2$, then find $q^2 - \frac{1}{q^2}$.

18. If $3x + 4y = 11$ and $xy = 12$, then find the value of $27x^3 + 64y^3$.

19. Find the value of $xy + yz + zx$ if $x + y + z = 12$ and $x^2 + y^2 + z^2 = 42$.

20. Use logarithm to find the value of:

$$0.7214 \times 20.5$$

21. If $x = 3$, find the value of x^4.

22. Factorize by factor theorem:

$$x^3 - x^2 - 22x + 40$$

23. Simplify to the lowest form:

$$\frac{x^3 - 8}{x^2 - 2x + 1} \div \frac{x^2 + 6x + 8}{x^2 - 2x + 1}$$

24. Factorize by factor theorem:

$$x^3 - 2x^2 - x + 2$$

25. Find the square root by division method:

$$x^4 - 10x^3 + 37x^2 - 60x + 36$$

26. Factorize by factor theorem:

$$x^3 + x^2 - 10x + 8$$

27. Use division method to find the square root:

$$\frac{x^2}{y^2} - 10\frac{y}{x} + 27 - 10\frac{x}{y} + \frac{y^2}{x^2}$$

28. Factorize the following cubic polynomial by factor theorem:

$$x^3 - x^2 - 22x + 40$$

29. Find the value of 'k' for which the following expression will become a perfect square:

$$4x^4 - 12x^3 + 37x^2 - 42x + k$$

30. Find H.C.F by division method:

$$2x^5 - 4x^4 + 6x, \quad x^5 + x^4 - 3x^3 - 3x^2$$

31. For what value of m is the polynomial $P(x) = 4x^3 - 7x^2 + 6x - 3m$ exactly divisible by $x + 2$?

32. Use division method to find the square root:

$$9x^4 - 6x^3 - 7x^2 + 16$$

33. Factorize by factor theorem:

$$x^3 - 3x^2 - 25x + 6$$

34. Use division method to find the square root:

$$4 + 25x^2 - 12x - 24x^3 - 16x^4$$

35. Factorize:

$$(x^2 - 4x)(x^2 - 4x - 1) - 20$$

36. Use the division method to find the square root:

$$4x^2 + 12xy + 9y^2 + 16x + 24y + 16$$

37. Find the value of l and m for which the following expression will become a perfect square:

$$x^4 + 4x^3 + 16x^2 + lx + m$$

38. Simplify to the lowest form:

$$\frac{x^2 + x - 6}{x^2 - x - 6} \times \frac{x^2 - 4}{x^2 - 9}$$

39. Find the value of K if $(x - 1)$ is a factor of:

$$x^3 - Kx^2 + 11x - 6$$

40. Factorize by factor theorem:

$$x^3 - 6x^2 + 3x + 10$$

41. Simplify to the lowest form:

$$\frac{x^4 - 8x}{2x^2 + 5x - 3} \times \frac{2x - 1}{x^2 + 2x + 4} \times \frac{x + 3}{x^2 - 2x - 2}$$

42. Without actual long division, determine whether $(x - 2)$ and $(x - 3)$ are factors of:

$$P(x) = x^3 - 12x^2 + 44x - 48$$

43. Find the square root by using the division method:

$$\frac{4x^2}{y^2} + \frac{20x}{y} + 13 - \frac{30y}{x} - \frac{9y^2}{x^2}$$

44. Factorize the following cubic polynomial by factor theorem:

$$x^3 + 5x^2 + 2x - 8$$

45. Find the value of l and m for which the following expression will become a perfect square:

$$49x^4 + 109x^2 + lx - m$$

Question 8 (Chapter 7 + 17)

1. Construct $\triangle ABC$, draw perpendicular bisectors. Given:

$$mAB = 4 \text{ cm}, \quad mBC = 4.8 \text{ cm}, \quad mAC = 3.6 \text{ cm}$$

2. Solve:

$$\frac{|x+5|}{2-x} = 6$$

3. Construct $\triangle ABC$, draw perpendicular bisectors of its sides. Given:

$$mAB = 5.3 \text{ cm}, \quad m\angle A = 45°, \quad m\angle B = 30°$$

4. Solve:

$$\frac{5(x-3)}{6} = x - \frac{x}{9}$$

5. Simplify:

$$\frac{x-3}{x-6} = 2 - \frac{2x}{x-2}$$

6. Construct the triangle ABC and draw the bisectors of angles. Given:

$$mAB = 4.2 \text{ cm}, \quad mBC = 6 \text{ cm}, \quad mCA = 5.2 \text{ cm}$$

7. Solve:

$$x + \frac{1}{3} = 2\left(x - \frac{2}{3}\right) - 6x$$

8. Construct the triangle ABC and draw the perpendicular bisectors of its sides. Given:

$$mAB = 2.4 \text{ cm}, \quad mAC = 3.2 \text{ cm}, \quad m\angle A = 120°$$

9. Solve:

$$\frac{1}{2}\left(x - \frac{1}{6}\right) + \frac{2}{3} = \frac{5}{6} + \frac{1}{3}(1 - 3x)$$

10. Construct the triangle XYZ and draw their medians. Given:

$$mXY = 4.5 \text{ cm}, \quad mYZ = 3.4 \text{ cm}, \quad mZX = 5.6 \text{ cm}$$

11. Solve the inequality:

$$5 + \frac{4 - 3x}{2} < 1$$

12. Construct $\triangle ABC$, draw perpendicular bisectors of its sides. Given:

$$mBC = 2.9 \text{ cm}, \quad m\angle A = 30°, \quad m\angle B = 60°$$

13. Solve the equation:

$$\frac{2}{x-1} = \frac{1}{x+1} \pm 17$$

14. Solve the inequality:

$$4 - \frac{1}{2}x \geq -7 + \frac{1}{4}x$$