

1. **Number Systems:**

- Classify the following numbers as rational or irrational:  $\sqrt{16}$ ,  $\pi$ ,  $\frac{3}{5}$ .
- Represent  $\frac{7}{8}$  on the number line.

2. **Polynomials:**

- Factorize the quadratic expression  $x^2 - 6x + 9$ .
- Using the Remainder Theorem, find the remainder when  $2x^3 - 5x^2 + 3x - 1$  is divided by  $(x - 2)$ .

3. **Coordinate Geometry:**

- Find the coordinates of the midpoint of the line segment joining  $(-3, 2)$  and  $(5, -4)$ .
- Prove that the points  $(-1, 2)$ ,  $(3, -4)$ , and  $(5, 6)$  form a right-angled triangle.

4. **Linear Equations in Two Variables:**

- Solve the system of equations:

$$\begin{aligned} 2x - y &= 5 \\ 3x + 2y &= 8 \end{aligned}$$

- Interpret the solution graphically.

5. **Triangles:**

- Prove the Pythagorean Theorem:  $a^2 + b^2 = c^2$ , where  $a$ ,  $b$ , and  $c$  are the sides of a right-angled triangle.
- In  $\triangle ABC$ , if  $\angle B = 90^\circ$  and  $\angle A = 30^\circ$ , find  $\sin C$ .

6. **Quadrilaterals:**

- Classify the quadrilateral with vertices at  $(1, 2)$ ,  $(4, 6)$ ,  $(7, 7)$ , and  $(3, 4)$ .
- Prove that the opposite angles of a parallelogram are equal.

7. **Circles:**

- Find the circumference of a circle with radius  $5\text{ cm}$ .
- Determine the area of a sector with a central angle of  $60^\circ$  in a circle of radius  $8\text{ cm}$ .