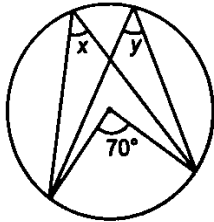


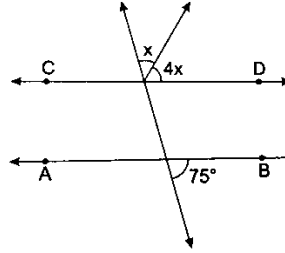
General Instructions:

- Section A consists of 20 questions; each carry one mark. All questions are compulsory.
- Section B consists of 5 question; each carry 2 marks. You have option in 2 question.
- Section C consists of 6 questions; each carry 3 marks. You have option in 2 questions.
- Section D consists of 4 questions; each carry 5 marks. You have option in 2 questions.
- Section E consists of 3 case study based questions; each carry 4 marks. You have option in the third part of each question.

SECTION – A (1 x 20 = 20 marks)

- Simplified form of $3^{\frac{2}{3}} \times 3^{\frac{1}{5}}$ is
a) $3^{\frac{2}{15}}$ b) $9^{\frac{2}{15}}$ c) $3^{\frac{2}{3}}$ d) $3^{\frac{13}{15}}$
- If $p(x) = x + 3$, then $p(x) + p(-x)$ is equal to
a) 3 b) $2x$ c) 0 d) 6
- The solution of the linear equation $y = 24$ and $x = 8$ is
a) $3y = x$ b) $y = x$ c) $y = 4x$ d) $y = 3x$
- If two complementary angles are in the ratio 13 : 5, then the angles are
a) $65^{\circ}, 25^{\circ}$ b) $130^{\circ}, 50^{\circ}$ c) $13x^{\circ}, 5x^{\circ}$ d) $60^{\circ}, 30^{\circ}$
- In an isosceles triangle ΔABC , AD is the median and $AB = AC$. If the value of $\angle ABD$ is 35° , then $\angle BAD$ is
a) 35° b) 55° c) 110° d) 70°
- A Quadrilateral whose diagonals bisect at right angles is called
a) A trapezium b) A rectangle
c) A rhombus d) none of these
- In the given figure, value of 'y' is
a) 35°
b) 140°
c) $70^{\circ} + x$
d) 70°

- Ramesh wants to form a triangle using three sticks of length 10cm, 5cm and 7cm. Then the semi-perimeter of the triangle will be
a) 22cm b) 11cm c) 10cm d) none of the above
- If the volume and the surface area of a sphere is equal, then it's radius will be
a) 2 units b) 1 unit c) 3 units d) 5 units
- The difference between the highest and the lowest value of the data is called
a) Class mark b) Frequency polygon
c) Range d) Class size
- The class mark of an interval is 32. If the lower limit is 20, then the value of the upper limit will be
a) 44 b) 84 c) 30 d) 64
- If polynomial $p(x) = 3x^4 - 4x^3 - 3x - 1$ is divided by $(x - 1)$, then remainder is
a) 3 b) -4 c) -1 d) $p(1)$
- The linear equation, $y = 3x + 5$ has
a) A unique solution b) only two solutions
c) infinitely many solutions d) no solution
- Three adjacent angles form a straight line. The value of the angles are $5y^{\circ}$, $3y^{\circ}$ and $2y^{\circ}$. Then the measure of the smallest angle will be
a) 20° b) 36° c) 18° d) 40°

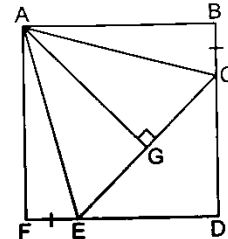
28. Find four solutions for the equation $4x + 3y = 24$. How many solutions of this equation are possible?
29. In the figure, if AB and CD are parallel, find the value of x.



(OR)

If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

30. ABDF is a square and $BC = EF$ in the given figure. Prove that
- $\Delta ABC \cong \Delta AFE$
 - $\Delta ACG \cong \Delta AEG$



31. The sides of a triangular ground are 5m, 7m and 8m. Find the cost of levelling the ground at the rate of 10Rs per m^2 . (Take $\sqrt{3} = 1.73$)
- (OR)
- Find the area of a triangle whose two sides are 18cm and 10cm and its perimeter is 42cm.

SECTION – D (5 x 4 = 20 marks)

32. Factorise the following:
- $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$
 - $x^3 + 3x^2y + 3xy^2 + y^3 - 125$
33. ABCD is a rhombus and P, Q, R and S are the mid- points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rectangle.
- (OR)

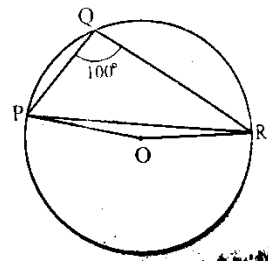
Prove the following:

- The diagonal of a parallelogram divides it into two congruent triangles.
- The bisectors of angles of a parallelogram form a rectangle.

34. Prove that:
- Equal chords subtend equal angles at the centre.
 - If two equal chords of a circle intersect within the circle, prove that the line joining the point of intersection to the centre makes equal angles with the chords.
- (OR)

Answer the following questions:

- Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.
- In the given figure, $\angle PQR = 100^\circ$, where P, Q and R are points on a circle with centre O. Find $\angle OPR$.



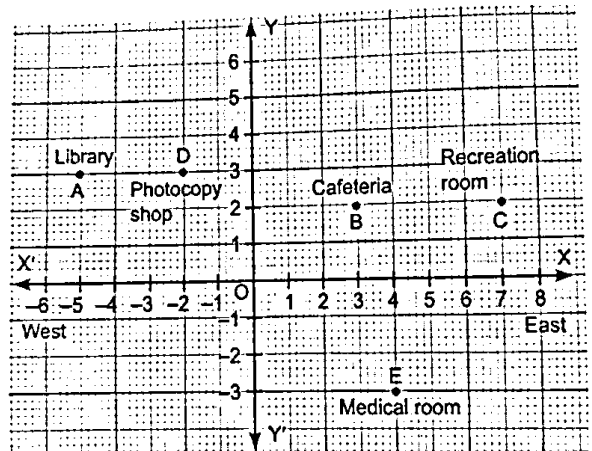
35. The following information shows the marks of the students of class IX. Draw a histogram for the following data:

Marks	Number of Students
10-15	7
15-20	9
20-25	8
25-30	5
30-40	12
40-60	12
60-80	8

SECTION - E (CASE STUDY BASED QUESTIONS) (4 x 3 = 12 marks)

36. CAMPUS

A university administrator tells a group of new students about the central campus building and facilities they provide to students. "Welcome everyone to the complex." Today I will explain you about some of the places of campus. You can assume it like a Cartesian plane on paper. If we start from the origin and move five steps towards left (west) and then 3 steps right, we reach the Library. Adjacent to Library, there is a photocopy shop. There is a Cafeteria, where students get an opportunity to relax and eat various cuisines. Parallel to Cafeteria there is a recreational room for students to play indoor games such as chess, carom etc. At point E is a medical room.



Now answer the following questions:

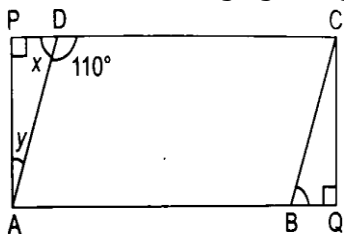
- What are the co-ordinates of the Library and the Medical Room?
- What will be the sign of the coordinates of the cafeteria?
- What is the sum of the ordinate of the Photocopy shop and the abscissa of the Recreational room?

(OR)

What are the quadrants of the Photocopy shop, Cafeteria, Medical Room and the Recreational room?

37. Wall Hanging

Roshni has made a wall hanging on cloth to decorate the living room of her house. The wall hanging was in a parallelogram shape. When she hanged it on wall using nail, point of one portion of the wall just came out. And it was not looking good. She became very upset. Her mother came and asked about the problem and came up with an idea. She told Roshni that she can add triangle shape different coloured cloth so that wall hanging can cover that spoiled part of the wall. Both decorated the wall hanging and got it framed. Now it was in a rectangular shape as shown in figure.



- AP is equal to which side?
- What is the measure of $\angle ADP$?
- Prove $\triangle APD$ and $\triangle CQB$ are congruent? (OR) Find the value of $\angle y$?

38. Clay modelling activity

Various studies have shown that clay modelling is a great activity which helps kids' development in many ways. Every child needs experience that matches his or her development level. Playing with clay involves both left and right brains. Left brain focuses on the discipline and right brain creates the imagination. It also helps to resolve stress and offers positive diversion. It promotes sensory development. In teaching Mathematics also, clay modelling is used in classrooms. Students of class IX have made some 3D shapes from clay modelling. Out of these two shapes, one is a hemispherical dome having circumference of base 132cm and another is a sphere.

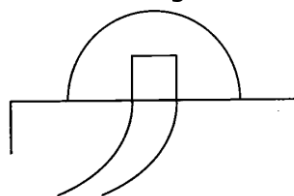


Fig. (i)

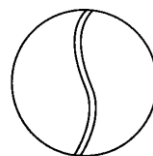


Fig. (ii)

- What will be the radius of the dome shaped portion in fig (i)?
- Find the area of the dome to be painted from outside.
- If the sphere in figure (ii) has diameter of 14cm, then find its volume.

(OR)

Find the ratio of the surface areas when the radius of the sphere is doubled?