

ATOMIC ENERGY CENTRAL SCHOOL NO. 3

RAWATBHATA

CLASS 09 - MATHEMATICS

CONFIDENCE I

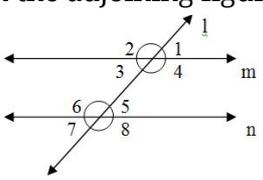
Time Allowed: 3 hours

Maximum Marks: 80

General Instructions:

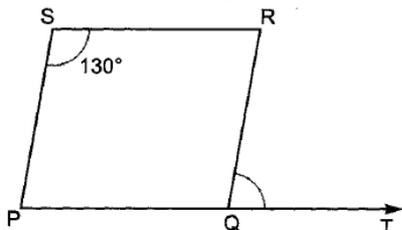
1. All the questions are compulsory.
2. The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
3. Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
4. There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted.

Section A

1. Every real number is [1]
 - a) either rational or irrational
 - b) rational
 - c) neither rational nor irrational
 - d) irrational
2. If $p(x) = (x - 1)(x + 1)$, then the value of $p(2) + p(1) - p(0)$ is [1]
 - a) 2
 - b) 4
 - c) 1
 - d) 3
3. In the adjoining figure, if $m \parallel n$, then $\angle 4 + \angle 7$ is equal to - [1]
 - a) 180°
 - b) 150°
 - c) 120°
 - d) 90°
4. In $\triangle ABC$ if $\angle B = \angle C = 30^\circ$, which of the following is the longest side? [1]
 - a) BC
 - b) none
 - c) AC
 - d) AB
5. A polynomial containing three non-zero terms is called a _____. [1]
 - a) monomial
 - b) trinomial
 - c) none of these
 - d) binomial

A hemi spherical bowl has a radius of 3.5 cm. What would be the volume of water it would contain?

19. In Fig. PQRS is a parallelogram in which $\angle PSR = 130^\circ$. Find $\angle RQT$ [1]



20. Express the given statement in the form of a linear equation in two variables. The sum of the ordinate and abscissa of a point is 6. [1]

21. Express $0.2555\dots$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$. [2]

22. Draw the graph of the linear equation in two variables: $x - y = 2$ [2]

23. Expand $(2x + 1)^3$ using suitable identity [2]

OR

What must be subtracted from $x^4 + 3x^3 + 4x^2 - 3x - 6$ to get $3x^3 + 4x^2 - x + 3$?

24. In parallelogram PQRS, $PQ = 10$ cm. The altitudes corresponding to the sides PQ and SP are respectively 7 cm and 8 cm. Find SP. [2]

25. Find the median of the following observation : 72, 68, 42, 33, 35, 39, 40, 41, 65, 69 [2]

OR

The mean of 16 numbers is 8. If 2 is added to every number, what will be new mean?

26. A cuboidal vessel is 10 m long and 8 m wide. How high must it be made to hold 380 cubic metres of a liquid ? [2]

27. Simplify the following by rationalizing the denominator: $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$ [3]

OR

Simply by rationalizing denominator $\frac{7+3\sqrt{5}}{7-3\sqrt{5}}$

28. Three vertices of a square are A(-1, -9), B(3, -1) and C(-5, 3). Plot the points. Then find the co-ordinates of the missing vertex D. [3]

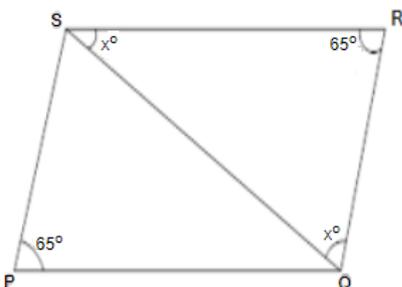
29. Yamini and Fatima, two students of Class IX of a school, together contributed Rs.100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which satisfies this data. (You may take their contributions as Rs. x and Rs. y) Draw the graph of the same. [3]

OR

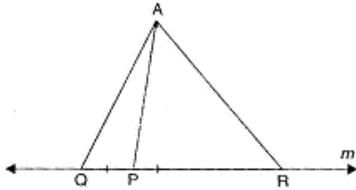
Draw the graph of the linear equation in two variables: $3 = 2x + y$

30. Construct an angle of $22\frac{1}{2}^\circ$. [3]

31. PQRS is a rhombus if $\angle P = 65^\circ$ find $\angle RSQ$ [3]



32. If figure, AP is the shortest line segment that can be drawn from A to the line m. If $PR > PQ$. Prove that $AR > AQ$. [3]



OR

S is any point on side QR of a $\triangle PQR$. Show that: $PQ + QR + RP > 2PS$.

33. Find the area of a quadrilateral ABCD in which $AB = 3$ cm, $BC = 4$ cm, $CD = 6$ cm, $DA = 5$ cm and diagonal $AC = 5$ cm. [3]
34. 1500 families with 2 children were selected randomly and the following data were recorded [3]

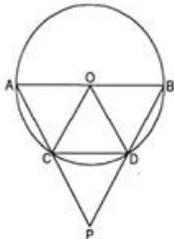
No. of girls in a family	No. of families
2	475
1	814
0	211

Compute the probability of a family, chosen at random, having.

- (i) 2 girls
- (ii) 1 girl
- (iii) No girl

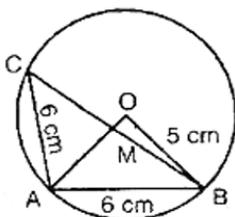
Also check the sum of these probabilities

35. AB is a diameter of the circle with centre O and chord CD is equal to radius OC. AC and BD produced meet at P. Prove that $\angle CPD = 60^\circ$ [4]

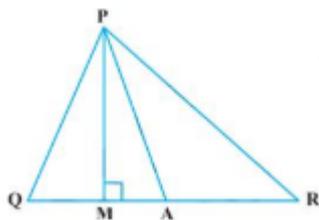


OR

Three girls Reshma, Salma and Mandip are standing on a circle of radius 5 m drawn in a park. Reshma throws a ball to Salma, Salma to Mandip, Mandip to Reshma. If the distance between Reshma and Salma and between Salma and Mandip is 6 m each, what is the distance between Reshma and Mandip?



36. In the given figure, $\angle Q > \angle R$, PA is the bisector of $\angle QPR$ and $PM \perp QR$. Prove that $\angle APM = \frac{1}{2}(\angle Q - \angle R)$ [4]



37. If $y^3 + ay^2 + by + 6$ is divisible by $y - 2$ and leaves remainder 3 when divided by $y - 3$, find the values of a and b . [4]

OR

Check whether $p(x)$ is a multiple of $g(x)$ or not:

- i. $p(x) = x^3 - 5x^2 + 4x - 3, g(x) = x - 2$
- ii. $p(x) = 2x^3 - 11x^2 - 4x + 5, g(x) = 2x + 1$

38. The inner diameter of a circular well is 3.5 m. It is 10 m deep. Find: [4]

- i. its inner curved surface area.
- ii. the cost of plastering this curved surface at the rate of ₹ 40 per m^2 .

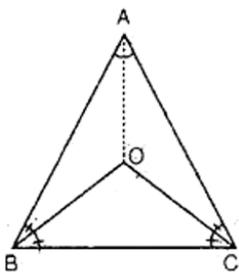
OR

What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6 m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. (Use $\pi = 3.14$)

39. In an isosceles triangle ABC, with $AB = AC$, the bisectors of $\angle B$ and $\angle C$ intersect each other at [4]

O. Join A to O. Show that:

- i. $OB = OC$
- ii. AO bisects $\angle A$.



40. The following table gives the distribution of students of two sections according to the marks obtained by them: [4]

Section A		Section B	
Marks	Frequency	Marks	Frequency
0-10	3	0-10	5
10-20	9	10-20	19
20-30	17	20-30	15
30-40	12	30-40	10
40-50	9	40-50	1

Represent the marks of the students of both the sections on the same graph by frequency polygons.

