

COUNCIL OF CBSE AFFILIATED SCHOOLS IN THE GULF
GULF SAHODAYA EXAMINATION, FEBRUARY 2009 / MARCH 2009

MATHEMATICS

Class : IX

Max. Marks : 80

Date : 15 FEB 2009

Duration : 3 Hours

Set No. : I

Code No. ■ 9221

GENERAL INSTRUCTIONS:

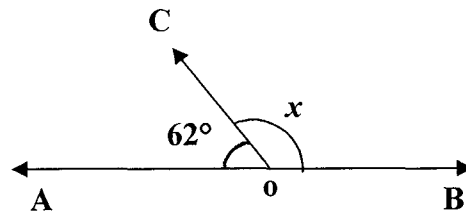
1. All questions are **compulsory**.
2. The question paper consists of **30 questions** divided into **four Sections A, B, C & D**.
Section A contains **10 questions** of **1 mark** each
Section B contains **5 questions** of **2 marks** each
Section C contains **10 questions** of **3 marks** each
Section D contains **5 questions** of **6 marks** each
3. There is no overall choice. However internal choice has been provided in one question of two marks each, three questions of three marks each and two questions of six marks each.
4. In question on constructions, the drawing should be neat and exactly as per the given measurements.
5. **Use of calculator is not permitted.**

SECTION – A

(10 x 1 = 10)

1. Prove that $\sqrt{5} - 2$ is irrational.
2. Find the zero of the polynomial, $p(x) = ax + b$ where $a, b, \neq 0$.
3. If the divisor of the polynomial, $p(x) = x^3 - ax^2 + 6x - a$ is $(x-a)$ then what is the remainder?
4. Where does the point $(n, 0)$ lie in the Cartesian plane? Where 'n' is a natural number.
5. Write any two Euclid's postulates.

6. In the figure, AOB is a straight line. Then what is the value of x ?



7. The perimeter of a right triangle is 12cm and its hypotenuse is of length 5cm. Find the other two sides.
8. If the radius of a sphere is halved then what is the new surface area?
9. If the mean of 10 observations is 20 and that of another 15 observations is 16. Find the mean of all 25 observations.
10. The floor of a rectangular hall has a perimeter 250m. The area of the four walls is 1500 m^2 . Find the height of the hall.

SECTION – B

(5 × 2 = 10)

11. Show that in a right angled triangle, the hypotenuse is the longest side.

OR

Prove that angles opposite to equal sides of an isosceles triangle are equal.

12. By how much is $\frac{1}{3-\sqrt{8}}$ larger than $\frac{1}{3+\sqrt{8}}$.
13. If the point (7, -5) lies on the graph of the equation $3y = ax + 7$ then find the value of a.
14. A joker's cap is in the form of a right circular cone of base radius 7cm and height 24cm. Find the area of the sheet required to make that cap.
15. If a bag contains 12 red and 8 blue balls, what is the probability that a ball drawn at random is red? Find also the probability that the ball drawn is blue?

SECTION – C

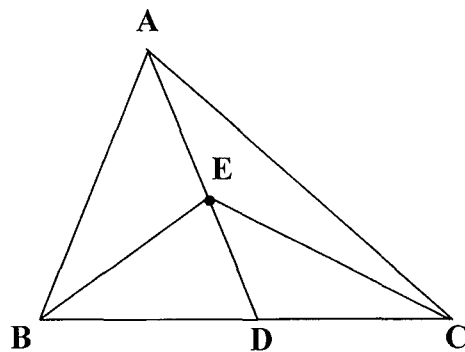
(10 x 3 = 30)

16. (i) Show that $1.\overline{27}$ can be expressed in the form $\frac{p}{q}$,
where p and q are integers and $q \neq 0$.
- (ii) Simplify : $\frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}}$.
17. If the remainder on dividing, $ax^2 - bx - 3$ by $(x - 1)$ is to be 4 and the remainder on dividing by $(x + 1)$ is to be -6, what should be the numbers a and b ?
18. In which quadrant will the point lie, if :
- (i) The y - coordinate is 3 and the x - coordinate is -4.
- (ii) The abscissa is -5 and ordinate is -3.
- (iii) The x - coordinate is 4 and y - coordinate is -2.
19. (i) Factorise : $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$
- (ii) Evaluate $(998)^3$ by using suitable identity.

OR

If $(x + y + z) \neq 0$ then show that, $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2} (x + y + z) [(x-y)^2 + (y-z)^2 + (z-x)^2]$

20. Locate the points (5, 0), (0,5) (2, 5) (5,2), (-3, 5), (-3, -5) in the Cartesian plane by choosing suitable units of distance on the axes.
21. In the following figure, E is the midpoint of median AD of a triangle ABC. Show that: $\text{ar}(\triangle BED) = \frac{1}{4} \text{ar}(\triangle ABC)$



OR

Prove that parallelograms on the same base and between the same parallels are equal in area.

22. Find the area of a quadrilateral ABCD whose sides in metres are 9, 40, 28 and 15 respectively and the angle between first two sides is a right angle and also given $AC = 41\text{m}$.

OR

Using Heron's formula, find the area of an equilateral triangle whose length of one side is 'a' cm.

23. Draw the graph of following equation, $y - 3x = 9$. Also find the coordinates of the points at which the line intersects both the axes.
24. In a city, the monthly observations made in a study on the cost of living index are given in the following table.

Cost of living index	Number of months
440 – 460	2
460 – 480	4
480 – 500	3
500 – 520	5
520 – 540	3
540 – 560	2
Total	19

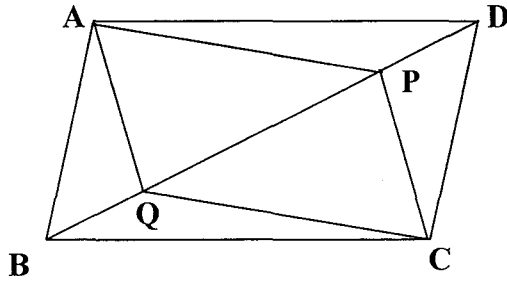
Draw a frequency polygon for the data above (without constructing a histogram)

25. Construct a triangle ABC where base, $BC = 6.5\text{cm}$, $CA + AB = 10\text{cm}$ and $\angle B = 60^\circ$.

SECTION – D

(5 x 6 = 30)

26. (i) In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP = BQ$. Show that :
- (a) $\triangle APD \cong \triangle CQB$
- (b) APCQ is a parallelogram

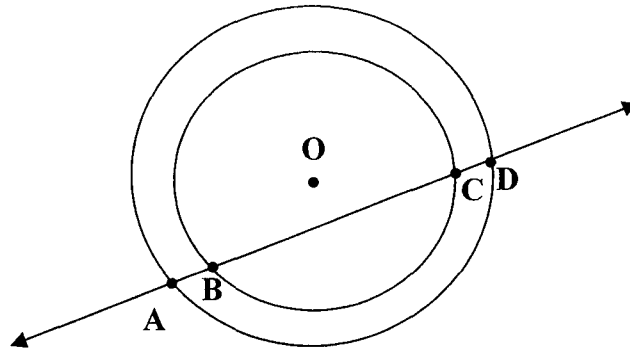


- (ii) The angles of a quadrilateral are in ratio 3 : 5 : 9 : 13. Find all the angles of the quadrilateral.

OR

State midpoint theorem; Also consider a rectangle ABCD and P, Q, R and S are midpoints of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.

27. (i) If a line intersects two concentric circles with centre O at A, B, C and D. Prove that $AB = CD$.



- (ii) ABCD is a cyclic quadrilateral whose diagonals intersect at a point E. If $\angle DBC = 70^\circ$, $\angle BAC = 30^\circ$ then find $\angle BCD$. Further, if $AB = BC$, find $\angle ECD$.
28. (i) Find the mean and median of first 8 prime numbers.
(ii) The mean of 13 observations is 14. If the mean of the first 7 observations is 12 and that of last 7 observations is 16, find the 7th observation.
29. Using long division method, find the remainder obtained on dividing the polynomial $3x^4 - 4x^3 - 3x - 1$ by $x - 1$. Also verify the result by using remainder theorem.

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

OR

At a mela, a stall keeper in one of the food stalls has a large cylindrical vessel of base radius 15cm filled upto a height of 32cm with orange juice. The juice is filled in small cylindrical glasses of radius 3cm upto a height of 8cm and sold for Rs. 3 each. How much money does the stall keeper receive by selling the juice completely?
