Class IX Subject- Mathematics - Semester -1

Time: 3-3$^1/_2$ hrs. **MM: 80**

GENERAL INSTRUCTIONS:

1. All questions are compulsory.

2. The question paper consists of thirty four questions divided into four sections A, B, C & D. Section A comprises of ten questions of 01 marks each, Section B comprises of eight questions of 02 marks each, Section C comprises of ten questions of 03 marks each and section D comprises of six questions of 04 marks each.

3. All questions in section A are multiple choice questions where you are to select one correct option out of given four.

4. There is no overall choice. However internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 04 mark each. You have to attempt only one of the alternatives in all such questions.

5. Use of calculators is not permitted.

Section – 'A' (carry one mark each)

1. A rational number equivalent to 5/7 is:

(a) 15/17 (b) 25/27 (c) 10/14 (d) 10/27

2. Given polynomial then is: $p(t) = t^4 - t^3 + t^2 + 6$, then $p(-1)$ is:

(a) 6 (b) 9

(c) 3 (d) -1

3. In quad ABCD BM$\perp$ AC and DN $\perp$ AC, such that BM=DN. If BR =8cm then BD is

a) 4 cm b)2cm

c) 12cm d) 16cm

4. Given two points A and B, there is one and only one that contains both the point. This statement is known as

a) Axiom b) Theorem

c) Postulates d) All of these

5. Given a line segment AB. P is the point on the perpendicular bisector of line segment AB, such that AP=10cm, also AB=12cm then distance of point P from line segment AB is

a) 6cm b) 5cm c) 7cm d)8cm

6. If the two complementary angles are in the ratio 13 : 5 , then the angles are:

(a) $65°, 35°$ (b) $65°, 25°$

(c) $13x°, 5x°$ (d) $25°, 65°$

7. The square root which number is rational:

(a) 7 (b) 1.96

c) 0.04 (d) 13

8. 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) None of these

9. In the figure < x is

a) Reflexive angle b) Acute angles c) Obtuse angle d) Exterior angle

10. What is the common between the three angles of a triangle & a linear pair:

(a) angles are equal (b) in both cases sum of angles is 180^0

(c) in triangle there are three angles & in linear pair there are two angles. (d) All of these

Section – 'B' (carry two marks each)

11. Express $23.\overline{43}$ in form p/q where $q \neq 0$

12. Find the value of x, if AB||CD

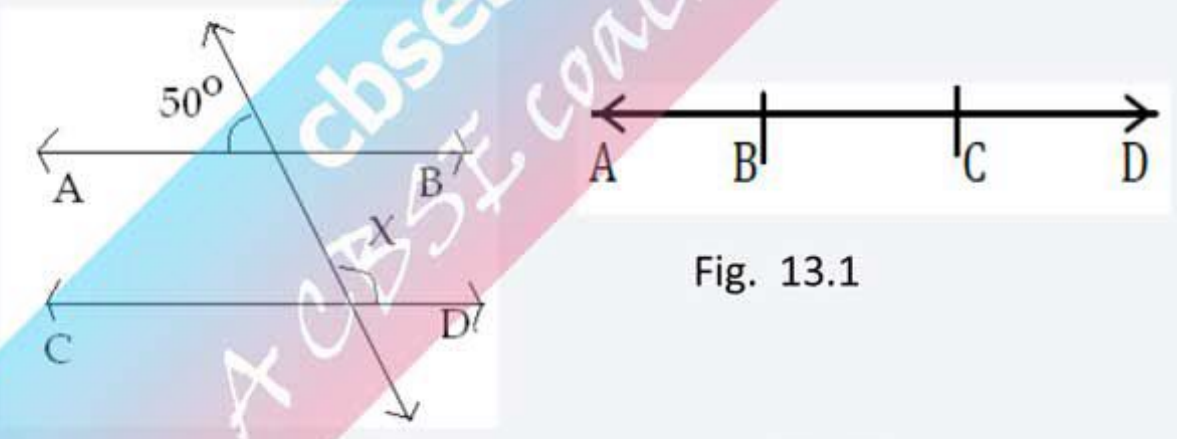


Fig. 13.1

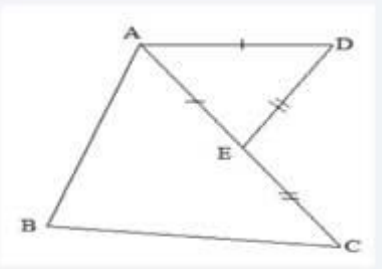


fig.16.1

13. In fig 13.1 if AC=BD, then prove that AB=CD.

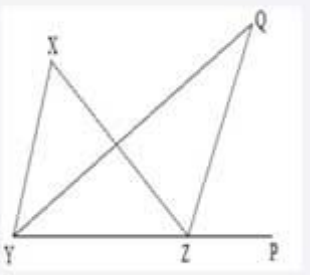
14 The sides of a triangular plot are in the ratio of 3:5:7 and its perimeter is 300m. Find its area.

15. Evaluate $(-1/27)^{-2/3}$

16. In the given fig.16.1 DE = EC. Show that AB + BC > AD

17. In fig. the side YZ of ΔXYZ is produced to a point P.

if the bisectors of < XYZ and < XZP meet at point Q. then prove that <YQZ = ½ < YXZ.



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

SECTION C

Question numbers 19 to 28 carry 3 marks each.

19. Simplify the following by rationalising the denominators

$$\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}}+\frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}}$$

OR

If $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}=a-\sqrt{15}b$, find the values of a and b.

20. If $a=9-4\sqrt{5}$, find the value of $a-\frac{1}{a}$.

OR

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

21. Represent $\sqrt{3.5}$ on the number line.

22. If $(x-3)$ and $x-\frac{1}{3}$ are both factors of ax^2+5x+b, show that $a=b$.

23. Find the value of $x^3+y^3+15xy-125$ when $x+y=5$.

OR

If $a+b+c=6$, find the value of $(2-a)^3+(2-b)^3+(2-c)^3-3(2-a)(2-b)(2-c)$

24. In Fig. 5. ABC is an equilateral triangle with coordinates of B and C as B(-3, 0) and C (3, 0) Find the coordinates of the vertex A.

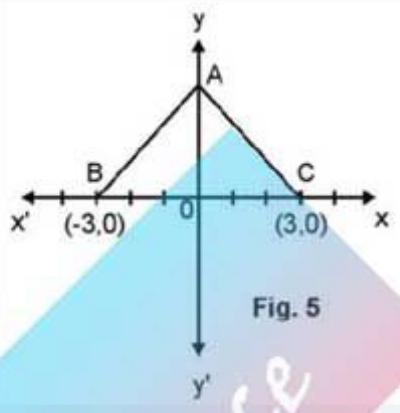


Fig. 5

25. **Factorize:** $x^{12} - y^{12}$

26. Prove: $a^3+b^3+c^3-3abc = \frac{1}{2}(a+b+c)[(a-b)^2+(b-c)^2+(c-a)^2]$

27. Locate the points (5,8), (0,5), (2,5), (5,2), (-3,0), (8,0) in the Cartesian plane

28. Find the area of a triangle, two sides of which are 18 cm and 10 cm and the perimeter is 42 cm.

Section – 'D' (carry four marks each)

29. In a qud. ABCD , BO and CO are bisectors o interior angles B and C intersecting at O. Show that <BOC = 90◦ +1/ 2 < BAC

30. Factories: $x^3 - 23x^2 + 142x + 120$

31. Factorize :$4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$

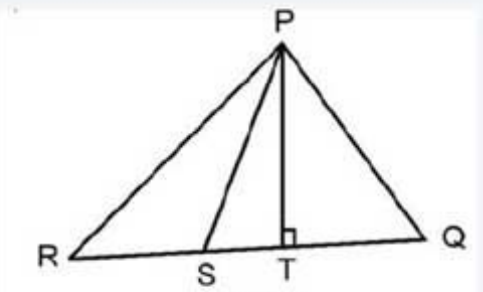


Fig. 9

32. In Fig. 9, PS is bisector of $\angle QPR$; $PT \perp RQ$ and $\angle Q > \angle R$. Show that $\angle TPS = \frac{1}{2}(\angle Q - \angle R)$.

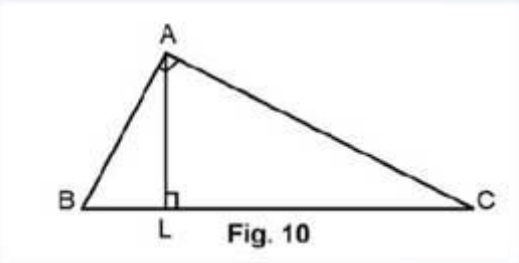


Fig. 10

33. In $\triangle ABC$, right angled at A, (Fig. 10), AL is drawn perpendicular to BC. Prove that $\angle BAL = \angle ACB$.

34. In Fig. 11, AB=AD, AC=AE and $\angle BAD = \angle CAE$. Prove that BC = DE.

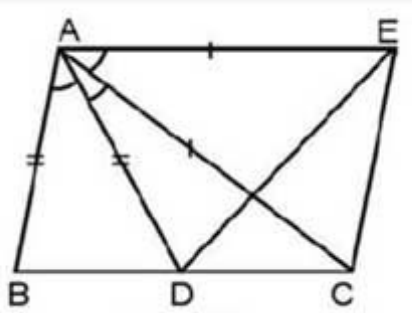


Fig. 11