26/Sept./2017 **Set - B**

FIRST TERM EXAMINATION (26 SEPT 2017)
MATHEMATICS
Class – IX

Time Allowed: 3 hours **Maximum Marks: 80**

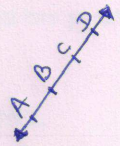
SECTION-A

Question numbers **1** to **6** carry one mark each

1 Write the degree of the given polynomial $x^4 + x + 3$ 1

2 Write the point whose ordinate is 7 and which lies on $y-axis$ 1

3 If AC=BD then prove that AB=CD 1



4 Find two irrational numbers between 3 and 5 1

5. Can a triangle have two right angles? Give reason. 1

6. In an isosceles triangle, if $\angle A = 100^0$ *and* $AB = AC$, *find* $\angle B$ *and* $\angle C$

SECTION-B

Question numbers **7** to **12** carry two marks each.

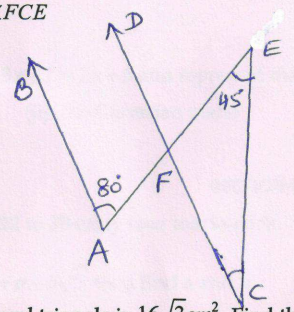
7. Express $1.3\overline{52}$ in the form of p/q, where p & q are integers and $q \neq 0$. 2

8. If (x-1) is a factor of the polynomial $x^5 - m^2x^3 + 2x + 1$. Then find the value m. 2

9. If $a = 2 - \sqrt{5}$ find $a - \frac{1}{a}$ 2

10. Plot the oints A (2, 5), B (8, 5) and C (5, -3) and join AB, BC and CA. What figure do you obtain? 2

11. If $AB \| CD$, *find* $\angle FCE$ 2



12. If area of an equilateral triangle is $16\sqrt{3}cm^2$. Find the attitude of the triangle. 2

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SECTION-C

Question numbers **13** to **21** carry three marks each.

13. Represent $\sqrt{3}$ on a number line. 3

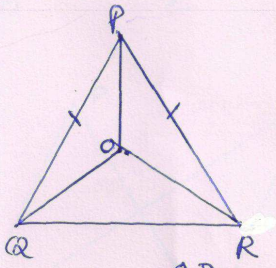
14. Simplify $\frac{9^{1/3} \times 27^{-1/2}}{3^{1/6} \times 3^{-2/3}}$ 3

15. A (3,6), B (3,2) and C (8, 2) are the vertices of a rectangle. Plot these points on a graph paper and then find the coordinates of the vertex D. 3

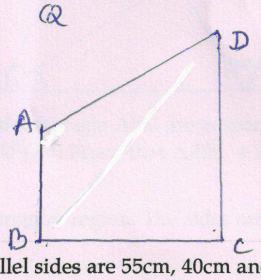
16. If a point R lies between two points P and Q such that PR=QR, then prove that $PR = \frac{1}{2}PQ$. Explain by drawing the figure. 3

17. Prove that if a transversal intersects two parallel lines, then angles in each pair of alternate interior angles are equal. 3

18. In an isosceles ΔPQR, in which PQ=PR, the bisectors of $\angle Q$ and $\angle R$ meet at O. Show that QO=RO and PO is the bisector of $\angle P$. 3



19. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD. Show that $\angle A > \angle C$ and $\angle B > \angle D$ 3



20. Find the area of the trapezium whose parallel sides are 55cm, 40cm and non parallel sides are 20cm and 25cm. 3

21. Solve the equation $3x + 2 = 2x + 5$ and represent the solution on 3
i) the number line (ii) the Cartesian plane

SECTION-D

Question numbers **22** to **30** carry four marks each.

22. If $\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + b\sqrt{5}$ then find a and b. 4

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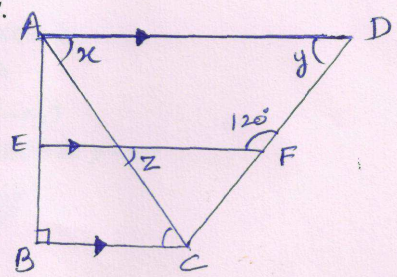
23. a) If $x+y+z=0$ then prove that $x^3+y^3+z^3=3xyz$ 2+2

b) Factorise $64x^3-y^3+8z^3+24xyz$

24. Factorise $3x^3-x^2-12x+4$ 4

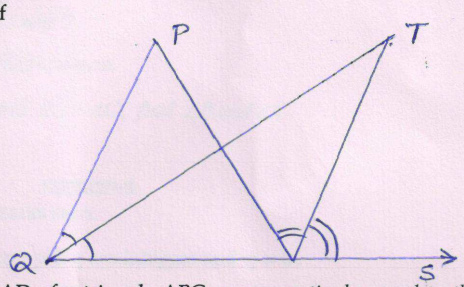
25. ABCD is a trapezium, $EF \parallel AD$ and $EF \parallel BC$. 4

Find x, y, z



26. In the given figure, the sides QR of a ΔPQR is produced to point S. If the bisectors of $\angle PQR$ and $\angle PRS$ meet at point T. 4

Then prove that $\angle QTR = \frac{1}{2}\angle QPR$



27. Two sides AC an BC and a median AD of a triangle ABC are respectively equal to the two sides PR, QR and a median PL of another ΔPQR. Prove that $\Delta ABC \cong \Delta PQR$. 4

28. A plot of land is in the shape of a right triangular region. The sides are of lengths 8m and 6m. Find the area of this region. 4

29. Factorise: (i) $27a^3-343b^3$ (ii) a^4-81 (2+2)

30. The food charges in a hostel are as follows for the first day the charges are Rs. 100 and for the subsequent days it is Rs. 50per day taking the number of days as x and total charges as Rs. y. Write a linear equation of this information and draw its graph. 4

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