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SET C



**INDIAN SCHOOL MUSCAT
FIRST MID TERM EXAMINATION
MATHEMATICS**

CLASS: IX
24.09.2018

Sub. Code: 041

Time Allotted: 3 Hrs
Max. Marks: 80

General Instructions:

1. All questions are **compulsory**.
2. The question paper consists of **30** questions divided into **four sections A, B, C and D**. **Section-A** comprises of **6** questions of **1 mark** each; **Section-B** comprises of **6** questions of **2 marks** each; **Section-C** comprises of **10** questions of **3 marks** each and **Section-D** comprises of **8** questions of **4 marks** each.
3. There is no overall choice in this question paper. However, an internal choice has been provided in four questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the questions in all such questions.
4. Use of calculator is not permitted.

SECTION – A (6 x 1 = 6)

Questions 1 to 6 carry 1 mark each.

1. In which quadrants the ordinate of a point is positive.
2. The area of an equilateral triangle $16\sqrt{3} \text{ cm}^2$. Find the length of the side of the triangle.
3. In $\triangle ABC$ and $\triangle DEF$, if $\angle A = \angle D = 90^\circ$, $\angle B = \angle E$ and $AC = DF$, then are the triangles congruent? If yes, by which congruence criterion?
4. Write an irrational number between 2 and 3.
5. Find the measure of the complementary angle of 63° .
6. Find the value of $25^{1/2} \times 289^{1/2}$

SECTION – B (6 x 2 = 12)

Questions 7 to 12 carry 2 marks each.

7. State any two Euclid's axioms.
8. The semi-perimeter of a triangle is 27 cm and the product of the difference of semi- perimeter and its respective sides is 2700. Find the area of the triangle.
9. Simplify: $(4\sqrt{3} - 3\sqrt{5})^2$.

10. Evaluate using suitable identity: 74×68
11. Simplify: $18 \sqrt[5]{243} - 6 \sqrt[3]{343}$
12. Factorize $2x^2 + 4y^2 + 3z^2 + 4\sqrt{2}xy - 4\sqrt{3}yz - 2\sqrt{6}xz$

SECTION – C (10 x 3 = 30)
Questions 13 to 22 carry 3 marks each

13. Find out the following from fig. 1:

- | | |
|---------------------------|--------------------------|
| (i) coordinates of B | (ii) abscissa of point D |
| (iii) ordinate of point F | (iv) coordinates of E |
| (v) abscissa of point C | (vi) coordinates of A |

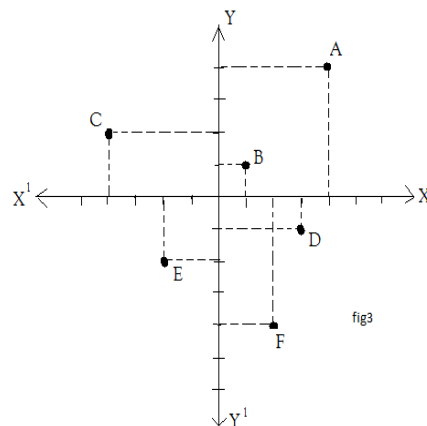


Fig. 1

14. (a) Factorise : $27 - 125a^3 - 135a + 225a^2$

OR

- (b) Find the value of $a^3 + b^3 + 6ab - 8$, when $a + b = 2$.

15. (a) ABCD is a square. X and Y are points on the sides AD and BC respectively such that $AY = BX$. Prove that $\angle XBA = \angle YAB$.

OR

- (b) Show that in a right angled triangle, the hypotenuse is the longest side.

16. (a) Locate $\sqrt{3}$ on the number line.

OR

- (b) Express $0.2353535\ldots$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

17. The polynomial $p(x) = x^4 - 2x^3 + x^2 - ax^3 + a - 7$ when divided by $(x + 1)$ leaves the remainder 19. Find 'a'. Then, find the remainder when $p(x)$ is divided by $(x + 2)$.

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

19. In fig.2, $AB = BC$ and $BX = BY$.
Show that $AX = CY$.
State the Euclid's axiom used.

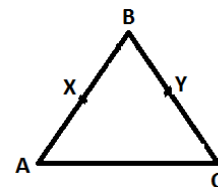


Fig. 2

20. (a) In fig.3 if $AB \parallel CF$, $CD \parallel FE$, then find the value of x .

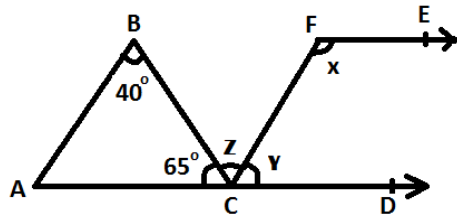


Fig.3

OR

- (b) In fig.4, $AB \parallel CD$. Then find x .

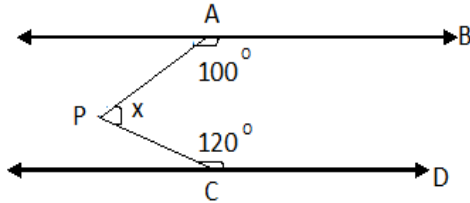


Fig.4

21. Prove that if two lines intersect each other, then the vertically opposite angles formed are equal.
22. If $x = 9 - 4\sqrt{5}$, find the value of $x^2 + \frac{1}{x^2}$.

SECTION – D (8 x 4 = 32)

Questions 23 to 30 carry 4 marks each

23. Plot the points A(4, 6), B (-2, 3), C (-2, -3) and D (4, -7) on a graph paper, join the points, identify the figure obtained and find its area.
24. (a) Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\triangle PQR$. Show that: $\triangle ABC \cong \triangle PQR$

OR

- (b) D is a point on side BC of $\triangle ABC$ such that $AD = AC$. Show that $AB > AD$.
25. Prove that the sum of three angles of a triangle is 180° . Using this result find the value of x and all the three angles if the angles are $(2x - 7)^\circ$, $(x + 25)^\circ$ and $(3x + 12)^\circ$
26. If the polynomials $(2x^3 + ax^2 + 3x - 5)$ and $(x^3 + x^2 + 4x + a)$ leaves the same remainder when divided by $(x - 2)$, find the value of a .
27. (a) Find the possible expressions for the dimensions of a cuboid whose volume is $x^3 - 23x^2 + 142x - 120$.

OR

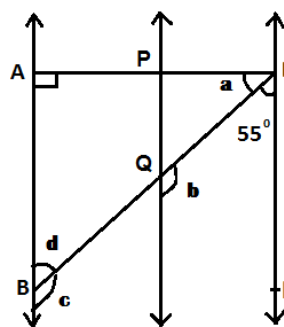
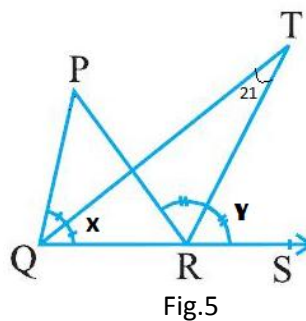
- (b) Find the value of $(ab + bc + ac)$, if $a + b + c = 9$ and $a^2 + b^2 + c^2 = 35$.

28. The lengths of two adjacent sides of a parallelogram are 17 cm and 12 cm. One of its diagonal is 25 cm long. Find the area of the parallelogram. Also find the length of the altitude corresponding to side of length 12 cm.

29. (a) In fig. 5, $\angle TRS = y$ and $\angle TQS = x$. Also QT and RT are angle bisectors of $\angle PQS$ and $\angle PRS$ respectively, Find the measure of $\angle QPR$.

OR

- (b) In Fig.6, $AB \parallel PQ$ and $PQ \parallel EF$. Also $EA \perp AB$. If $\angle BEF = 55^\circ$, Find the values of a, b, c and d.



30. Simplify and find p and q:

$$\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = p - 7\sqrt{5}q$$

End of the Question Paper