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INDIAN SCHOOL SALALAH

ANNUAL EXAMINATION, MARCH, 2017-18

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MAX.MARKS: 80

CLASS: IX **MATHEMATICS** **TIME: 3 HOURS**

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## General Instructions:

i. All Questions are compulsory.

ii. The question paper consists of thirty questions divided into 4 sections A, B, C and D.

iii. Section A comprises of 6 questions of 1 mark each, section B comprises of 6 questions of 2 marks each, section C comprises of ten questions of 3 marks each and section D comprises of 8 questions of 4 marks each.

iv. There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each, three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.

v. Use of calculators is not permitted.

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<u>Section-A</u>

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1. Find the value of $\dfrac{1}{2\sqrt{5}}$ when $\sqrt{5} = 2.236$.

2. If $(x^2 + kx - 3) = (x - 3)(x + 1)$, then find k.

3. One of the angles of a triangle is $65°$. Find the remaining two angles, if their difference is $25°$.

4. If O is centre of circle as shown in the figure, find $\angle CBD$.
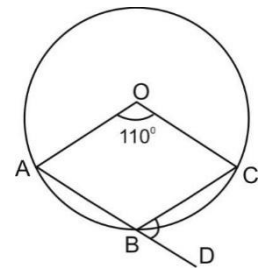
5. If the height and the radius of a cone is tripled, then find the ratio of volume of new cone and that of original cone.

6. In a class of 12 students, 5 are boys and the rest are girls. Find the probability that a student selected will be a girl?

Section-B

7. If $x + y = 12$ and $xy = 27$, find the value of $x^3 + y^3$.

8. Answer the following:

    (i) A point lies on y-axis, and then which coordinate is zero? And what is the representation?

    (ii) If a point is at a distance of 2 units from y-axis and 3 units from x-axis. Write the coordinates.

9. Without plotting the given points on a graph paper, indicate the quadrants in which they lie if

    (i) Ordinate = 6, abscissa = -3

    (ii) Ordinate = -6, abscissa = 4

    (iii) Abscissa = -5, ordinate = -7

    (iv) Ordinate = 3, abscissa = 5

10. In the figure, $PQ \perp PR$, $PQ // RL$, $\angle RQT = 38°$ and $\angle QTL = 75°$, find x and y.
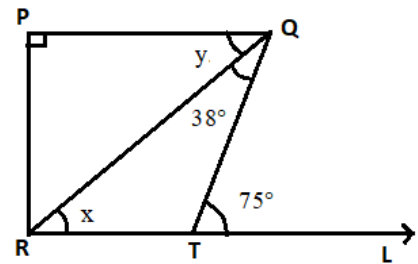
11. A rectangular sheet of paper 44 cm $\times$ 20 cm is rolled along its length and a cylinder is formed. Find the volume of the cylinder.

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

Section-C

13. Arrange the following numbers in ascending order: $\sqrt[3]{5}$, $\sqrt[4]{8}$, $\sqrt{3}$.

    (Or)

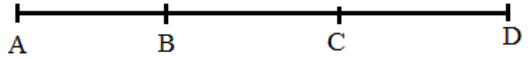   Represent $\sqrt{7.3}$ on the number line.

14. Evaluate using suitable identity: $(104)^3$

15. If $x = 5 - 2\sqrt{6}$, then find the value of $x^2 + \dfrac{1}{x^2}$

    (Or)

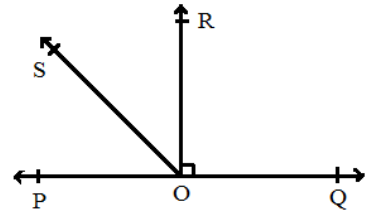   If $a + b = c$, then show that $b^2 + ac = c^2 - ab$.

16. In the figure, AC = BD prove that AB = CD.

17. In the figure, POQ is a line. Ray OR is perpendicular to line
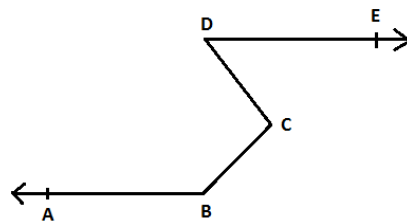
    PQ. OS is another ray lying between rays OP and OR.

    Prove that $\angle ROS = \dfrac{1}{2}\left(\angle QOS - \angle POS\right)$.

(Or)

In the given figure, BA//ED. Prove that
$\angle ABC + \angle BCD = 180° + \angle CDE$.

18. ABCD is a rhombus and P, Q, R and S are mid-points of the sides AB, BC, CD and

    DA respectively. Show that the quadrilateral PQRS is a rectangle.

19. ABCD is trapezium with AB//DC. A line parallel to AC intersects AB at X and BC at

    Y. Prove that ar(ADX) = ar(ACY).

20. The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the

    smaller side and the third side is 6 cm less than twice the smaller side. Find the area

    of the triangle.

21. A hemispherical bowl with radius 6 cm is filled with water. If the water is transferred

    into cylindrical vessel of base 3 cm, find the height to which the water rises in the

    cylindrical vessel. [use $\pi = \dfrac{22}{7}$]

(Or)

A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7 cm.

If the bowl is filled with soup to a height of 4 cm, how much soup the hospital has to

prepare daily to serve 250 patients? [Use $\pi = \dfrac{22}{7}$]

22. On one page of a telephone directory, there are 200 phone numbers. The frequency distribution of their digits is given below:

Unit digit	0	1	2	3	4	5	6	7	8	9
Frequency	19	22	23	19	21	24	23	18	16	15

One of the numbers is chosen at random from the page. What is the probability that the unit digit of the chosen number is   (i) less than 3?   (ii) more than 7? (iii) between 2 and 5?

Section-D

23. Find the values of a and b if $a + b\sqrt{6} = \dfrac{5 + \sqrt{6}}{5 - \sqrt{6}}$.

24. The polynomials $x^3 + 2x^2 - 5ax - 8$ and $x^3 + ax^2 - 12x - 6$ when divided by $x - 2$ and $x - 3$ leave the remainders are q and p respectively. If $q - p = 10$, find the value of a

(Or)

If $x + y + z = 10$, $xy + yz + zx = -15$ and $xyz = -12$,   then   find   the   values   of $x^2 + y^2 + z^2$ and $x^3 + y^3 + z^3$.

25. Draw the graph of the equation $7x + 5y = 35$. Find the area of the figure formed by this line and the two axis.

(Or)

An auto rickshaw fare in the city is charged Rs.10 for the first kilometer and Rs.4 per kilometer for subsequent distance covered. Write the linear equation to express the above statement. Draw the graph of the linear equation.

26. ABCD is a parallelogram, if the two diagonals are equal, find the measure of $\angle ABC$.

27. If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord.

(Or)

If non-parallel sides of a trapezium are equal, prove that it is cyclic.

28. Construct a triangle ABC, in which $\angle B = 60°$, $\angle C = 45°$ and AB+BC+CA = 11 cm.

29. The residents of a society decided to paint the wall of a cancer detection centre in their premises. If the floor of the cuboidal hall has perimeter equal to 260 m and height 6 m, then

(i) Find the cost of painting the wall (including doors etc.) at the rate of Rs. 9 per m^2.

(ii) What is the amount contributed by each one if there are 50 people?

(iii) Which value is depicted by the residents?

30. Draw a histogram and frequency polygon for the following data.

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
560-580	1
580-600	4
Total	24

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