KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION

SAMPLE PAPER 03 FOR SESSING ENDING EXAM (2017-18)

SUBJECT: MATHEMATICS **MAX. MARKS : 80**

CLASS : IX **DURATION : 3 HRS**

General Instruction:

(i) **All** questions are compulsory.

(ii) This question paper contains **30** questions divided into four 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 10 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 and 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

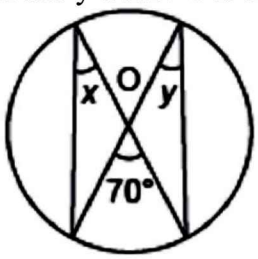
SECTION – A

Questions 1 to 6 carry 1 mark each.

1. Find the value of the polynomial $p(y) = y^2 - 5y + 6$ at (i) $y = 2$ (ii) $y = -2$

2. A rabbit covers y metres distance by walking 10 metres in slow motion and the remaining by x jumps, each jump contains 2 metres. Express this information in linear equation.

3. In the given figure, find the value of x and y where O is the centre of the circle.



4. Find the area of an equilateral triangle with side $2\sqrt{3}$ cm.

5. Two coins are tossed simultaneously 500 times, and we get

Two heads : 105 times One head : 275 times

Find the probability of getting 0 head.

6. Find the height of cone, if its slant height is 34 cm and base diameter is 32 cm.

SECTION – B

Questions 6 to 12 carry 2 marks each.

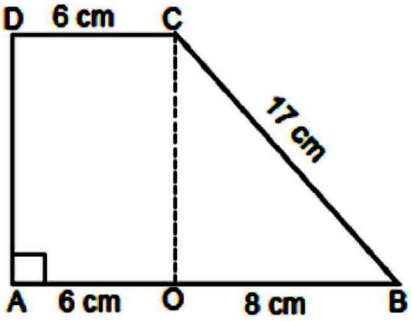
7. Using suitable identity, evaluate $(-32)^3 + (18)^3 + (14)^3$

8. If angles A, B, C and D of the quadrilateral ABCD, taken in order, are in the ratio 3 : 7 : 6 : 4, then name the type of quadrilateral ABCD.

9. Diagonals AC and BD of a quadrilateral ABCD intersect each other at P. Show that ar(APB) × ar(CPD) = ar(APD) × ar(BPC)

10. Find the median and mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18.

11. Calculate the area of trapezium as shown in the figure:



12. How many square metres of canvas is required for a conical tent whose height is 3.5 m and the radius of whose base is 12 m?

SECTION – C

Questions 13 to 22 carry 3 marks each.

13. Find the value of a and b, if $\frac{2-\sqrt{5}}{2+3\sqrt{5}} = a\sqrt{5} + b$

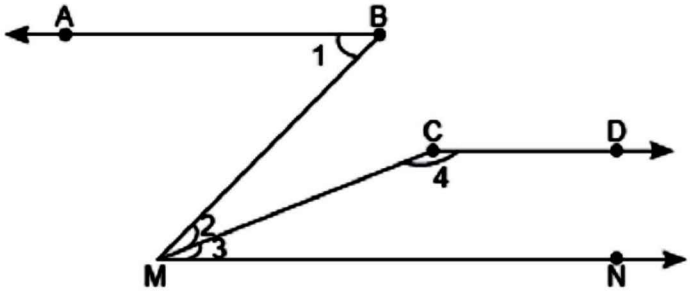
OR

Write the value of $\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a}$

14. If $2x + 3y = 12$ and $xy = 6$, find the value of $8x^3 + 27y^3$.

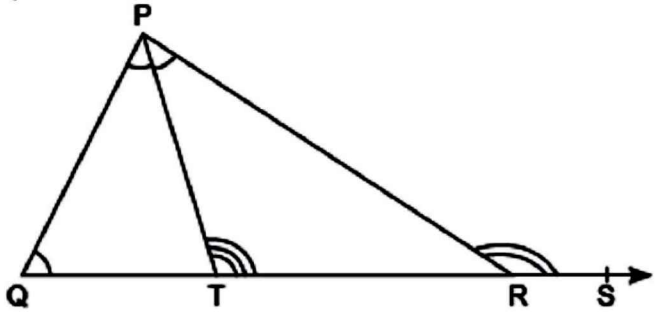
15. Draw the graph of the linear equation $x + 2y = 8$ and find the point on the graph where abscissa is twice the value of ordinate.

16. In the given figure, $\angle 1 = 55°$, $\angle 2 = 20°$, $\angle 3 = 35°$ and $\angle 4 = 145°$. Prove that AB || CD.



OR

Side QR of ΔPQR is produced to a point S as shown in the figure. The bisector of P meets QR at T. Prove that $\angle PQR + \angle PRS = 2\ \angle PTR$.

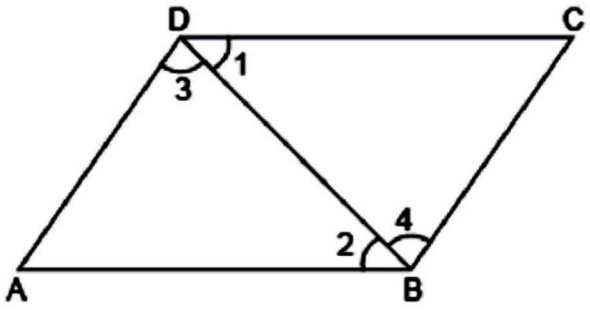


17. If the altitude drawn from the vertices of ABC to the opposite sides are equal, prove that the triangle is equilateral.

OR

Prove that the sum of any two sides of a triangle is greater than the third side.

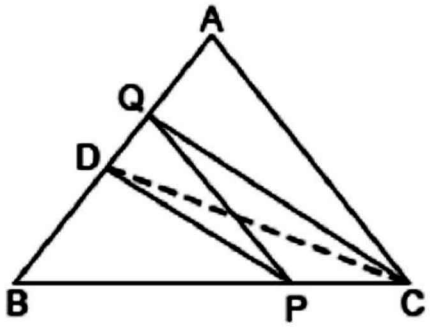
18. In the given figure, it is given that $\angle 1 = \angle 4$ and $\angle 3 = \angle 2$. By which Euclid's axiom, it can be shown that if $\angle 2 = \angle 4$, then $\angle 1 = \angle 3$.



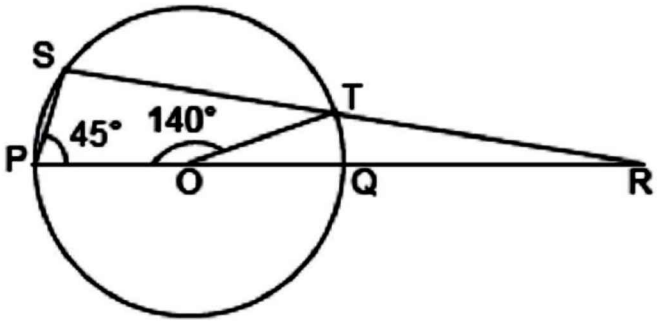
19. ABCD is a parallelogram. E is a point on BA such that BE = 2EA and F is a point on DC such that DF = 2FC. Prove that AECF is a parallelogram whose area is one-third of the area of parallelogram ABCD.

OR

In ABC, D is the mid-point of AB and P is any point on BC. If CQ || PD meets AB in Q in the given figure, then prove that ar(Δ BPQ) = ar(Δ ABC)



20. If O is centre of circle as shown in figure, find $\angle$ RQT and $\angle$ RTQ



21. A die is thrown 1000 times with the frequencies for the outcomes 1, 2, 3, 4, 5 and 6 as given in the following table :

Outcome	1	2	3	4	5	6
Frequency	179	150	157	149	175	190

Find the probability of getting each outcome.

22. The sides of a triangle are in the ratio 13 : 14 : 15 and its perimeter is 84 cm. Find the area of the triangle.

SECTION – D

Questions 23 to 30 carry 4 marks each.

23. Prove that $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$

24. Plot the points A(0, 3), B(5, 3), C(4, 0) and D(– 1, 0) on the graph paper. Identify the figure ABCD and find whether the point E(2, 2) lies inside the figure or not?

25. If a + b + c = 0, then prove that $\frac{(b+c)^2}{3bc}+\frac{(c+a)^2}{3ca}+\frac{(a+b)^2}{3ab}=1$

OR

Find the value of m and n so that the polynomial f(x) = x3 – 6x2 + mx – n is exactly divisible by (x –1) as well as (x – 2).

26. In a class, number of girls is x and that of boys is y. Also, the number of girls is 10 more than the number of boys. Write the given data in the form of a linear equation in two variables. Also, represent it graphically. Find graphically the number of girls, if the number of boys is 20.

27. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that

(i) D is the mid-point of AC (ii) MD $\perp$ AC (iii) CM = MA = $\frac{1}{2}$AB

OR

Show that the quadrilateral formed by joining the mid-points of the sides of a square, is also a square.

28. As a part of Corporate Social Responsibility (CSR) activity, an industrialist wishes to construct a hospital for animals on a triangular shaped plot.

(i) Construct a triangle for the same in which BC = 8 m, $\angle$B = 45° and AB – AC = 3.5 m by using proper scale.

(ii) What ideas are promoted by the industrialist?

29. A random survey of the number of children of various age groups playing in a park was found as follows:

Age (in years)	Number of children
1 – 2	5
2 – 3	3
3 – 5	3
5 – 7	12
7 – 10	9
10 – 15	10
15 – 17	4

Draw a histogram to represent the data above.

30. A wall 6 m long, 5 m high and 0.5 m thick is to be constructed with bricks, each having length 25 cm, breadth 12.5 cm and height 7.5 cm. Find the number of bricks required to construct the wall, if it is given that cement and sand mixture occupy of the volume of the wall.

OR

A lead pencil consists of a cylinder of wood with solid cylinder of graphite filled into it. The diameter of the pencil is 7 mm, the diameter of the graphite is 1 mm and the length of the pencil is 10 cm. Calculate the weight of the whole pencil, if the specific gravity of the wood is 0.7 g/cm^3 and that of the graphite is 2.1 g/cm^3.