KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
SAMPLE PAPER 01 FOR SESSING ENDING EXAM (2017–18)

SUBJECT: MATHEMATICS(041)

<u>BLUE PRINT : CLASS IX</u>

Unit	Chapter	VSA (1 mark)	SA – I (2 marks)	SA – II (3 marks)	LA (4 marks)	Total	Unit Total
Number system	Number Systems	1(1)	--	3(1)*	4(1)	8(3)	8(3)
Algebra	Polynomials	--	2(1)	3(1)	4(1)*	9(3)	17(6)
Algebra	Linear Equations in two variables	1(1)	--	3(1)	4(1)	8(3)	17(6)
Coordinate Geometry	Coordinate Geometry	--	--	--	4(1)	4(1)	4(1)
Geometry	Introduction to Euclid's Geometry	--	--	3(1)	--	3(1)	28(10)
Geometry	Lines and Angles	--	--	3(1)*	--	3(1)	28(10)
Geometry	Triangles	--	--	3(1)*	--	3(1)	28(10)
Geometry	Quadrilaterals	--	2(1)	--	4(1)*	6(2)	28(10)
Geometry	Area of Parallelograms and triangles	--	2(1)	3(1)*	--	5(2)	28(10)
Geometry	Circles	1(1)	--	3(1)	--	4(2)	28(10)
Geometry	Constructions	--	--	--	4(1)	4(1)	28(10)
Mensuration	Heron's Formula	1(1)	2(1)	3(1)	--	6(3)	13(6)
Mensuration	Surface Areas and Volumes	1(1)	2(1)	--	4(1)*	7(3)	13(6)
Statistics and Probability	Statistics	--	2(1)	--	4(1)	6(2)	10(4)
Statistics and Probability	Probability	1(1)	--	3(1)	--	4(2)	10(4)
	Total	**6(6)**	**12(6)**	**30(10)**	**32(8)**	**80(30)**	**80(30)**

Note: * - Internal Choice Questions

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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 total surface area of a hemisphere of radius 10 cm. (Use $\pi = 3.14$)

2. If the point (3, 4) lies on the graph of the equation $3y = ax + 7$, find the value of a.

3. Simplify: $\dfrac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}}$

4. In a bag, there are 100 bulbs out of which 30 are defective ones. A bulb is taken out of the bag at random. Find the probability of the selected bulb to be a good one.

5. If its perimeter of an equilateral triangle is 180 cm, what will be its area?

6. In the below figure, $\angle ABC = 69°$, $\angle ACB = 31°$, find $\angle BDC$.
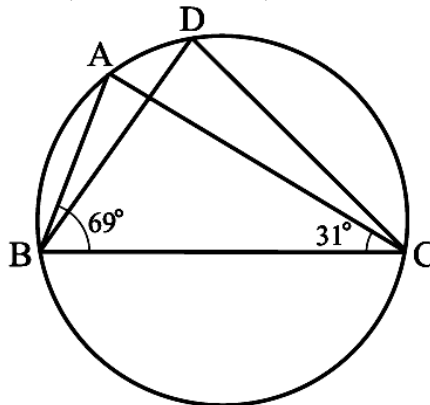
SECTION – B
Questions 6 to 12 carry 2 marks each.

7. A river 3 m deep and 40 m wide is flowing at the rate of 2 km per hour. How much water will fall into the sea in a minute?

8. Find the value of $x^3 + y^3 + 15xy – 125$ if $x + y = 5$.

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9. The following observations have been arranged in ascending order. If the median of the data is 63, find the value of x.

$$29, 32, 48, 50, x, x + 2, 72, 78, 84, 95$$

10. The angles of quadrilateral are in the ratio 3 : 5 : 9 : 13. Find all the angles of the quadrilateral.

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

12. In the below figure, ABCD is a parallelogram, AE ⊥ DC and CF ⊥ AD. If AB = 16 cm, AE = 8 cm and CF = 10 cm, find AD.
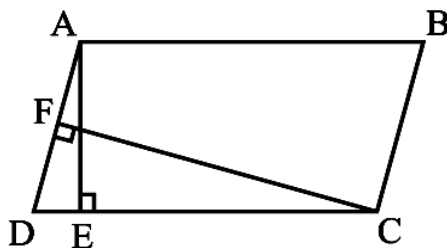
SECTION – C
Questions 13 to 22 carry 3 marks each.

13. In the below figure, ABCD is a quadrilateral and BE ∥ AC and also BE meets DC produced at E. Show that area of Δ ADE is equal to the area of the quadrilateral ABCD.
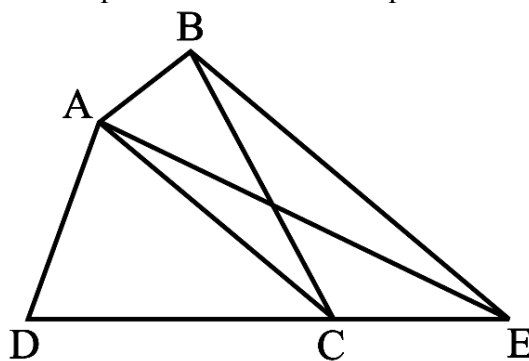
OR

Show that a median of a triangle divides it into two triangles of equal areas.

14. Factorise $x^3 - 23x^2 + 142x - 120$.

15. A die is rolled 300 times and following outcomes are recorded:

Outcome	1	2	3	4	5	6
Frequency	42	60	55	53	60	30

Find the probability of getting a number (i) more than 4 (ii) less than 3

16. A floral design on a floor is made up of 16 tiles which are triangular, the sides of the triangle being 9 cm, 28 cm and 35 cm. Find the cost of polishing the tiles at the rate of 50p per cm².

17. If a point C lies between two points A and B such that AC = BC, then prove that $AC = \frac{1}{2} AB$.

Explain by drawing the figure.

18. Solve the equation 2x + 1 = x – 3, and represent the solution(s) on (i) the number line, (ii) the Cartesian plane.

19. AB is a line-segment. P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B (see below left figure). Show that the line PQ is the perpendicular bisector of AB.
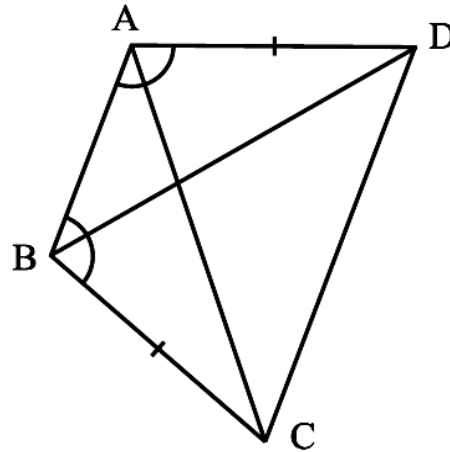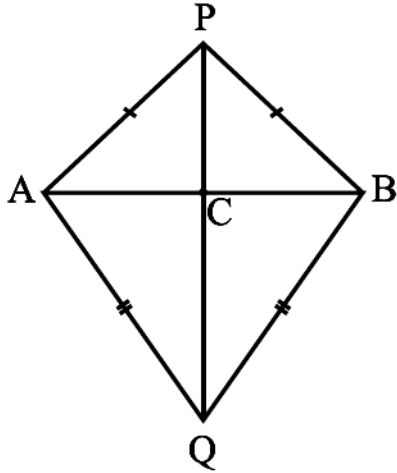
OR

ABCD is a quadrilateral in which AD = BC and ∠ DAB = ∠ CBA (see the above right sided figure). Prove that (i) Δ ABD ≅ Δ BAC (ii) BD = AC (iii) ∠ ABD = ∠ BAC.

20. In the below left figure, if AB ∥ CD, CD ∥ EF and y : z = 3 : 7, find x.
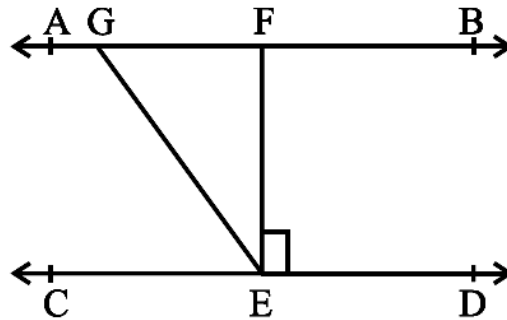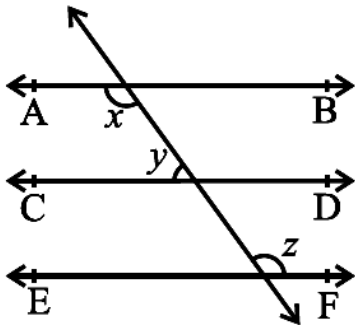
OR

In the above right sided figure, if AB ∥ CD, EF ⊥ CD and GED = 126°, find ∠ AGE, ∠ GEF and ∠ FGE.

21. A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and also at a point on the major arc.

22. Find the value of a and b in $\dfrac{5+2\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}$

OR

Simplify $\dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}} + \dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ by rationalizing the denominator.

SECTION – D
Questions 23 to 30 carry 4 marks each.

23. Find the value of $\dfrac{4}{(216)^{\frac{-2}{3}}} + \dfrac{1}{(256)^{\frac{-3}{4}}} + \dfrac{2}{(243)^{\frac{-1}{5}}}$

24. A dome of a building is in the form of a hemisphere. From inside, it was white-washed at the cost of Rs 498.96. If the cost of white-washing is Rs 2.00 per square metre, find the (i) inside surface area of the dome, (ii) volume of the air inside the dome.

OR

Monica has a piece of canvas whose area is 551 m^2. She uses it to have a conical tent made, with a base radius of 7 m. Assuming that all the stitching margins and the wastage incurred while cutting, amounts to approximately 1 m^2, find the volume of the tent that can be made with it.

25. Construct a triangle XYZ in which $\angle Y = 30°$, $\angle Z = 90°$ and XY + YZ + ZX = 11 cm.

26. Show that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus.

OR

Prove that "The line-segment joining the mid-points of any two sides of a triangle is parallel to the third side and is half of it."

27. Plot the points A (4, 4) and (–4, 4) on a graph sheet. Join the lines OA, OB and BA. What figure do you obtain.

28. A man hired an auto for 5 km. The fare was 10 for first km and 3 for every subsequent km. He paid 50, to which the auto driver said that its not the correct amount. The actual fare is somewhat less than that the amount you have paid to me.
(i) Calculate the correct fare.
(ii) Which value is being promoted by the auto driver?

29. The following table gives the life times of 400 neon lamps:

Life time (in hours)	Number of Lamps
300 – 400	14
400 – 500	56
500 – 600	60
600 – 700	86
700 – 800	74
800 – 900	62
900 – 1000	48

(i) Represent the given information with the help of a histogram.
(ii) How many lamps have a life time of more than 700 hours?

30. If $x^3 + ax^2 + bx + 6$ has (x – 2) as a factor and leaves a remainder 3 when divided by (x – 3), find the values of a and b.

OR

Without actual division, prove that $2x^4 – 6x^3 + 3x^2 + 3x – 2$ is exactly divisible by $x^2 – 3x + 2$.