

KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
SAMPLE PAPER 02 FOR HALF YEARLY EXAM (2017-18)

SUBJECT: MATHEMATICS(041)

BLUE PRINT FOR HALF YEARLY EXAM: CLASS IX

Chapter	VSA (1 mark)	SA – I (2 marks)	SA – II (3 marks)	LA (4 marks)	Total
Number System	1(1)	2(1)	3(1)	4(1)	10(4)
Polynomials	1(1)	2(1)	3(1)	4(1)	10(4)
Coordinate Geometry	1(1)	--	3(1)	4(1)	8(3)
Linear Equation in two variables	1(1)	--	3(1)	4(1)	8(3)
Introduction to Euclid's Geometry	--	2(1)	3(1)	--	5(2)
Lines and Angles	1(1)	2(1)	3(1)	4(1)	10(4)
Triangles	--	2(1)	6(2)	4(1)	12(4)
Quadrilaterals	1(1)	2(1)	3(1)	4(1)	10(4)
Areas of Parallelograms and triangles	--	--	3(1)	4(1)	7(2)
Total	6(6)	12(6)	30(10)	32(8)	80(30)

MARKING SCHEME FOR HALF YEARLY EXAM

SECTION	MARKS	NO. OF QUESTIONS	TOTAL
VSA	1	6	08
SA – I	2	6	12
SA – II	3	10	30
LA	4	8	32
GRAND TOTAL			80

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SUBJECT: MATHEMATICS
CLASS : IX

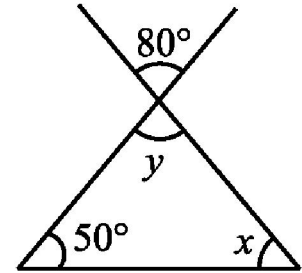
MAX. MARKS : 80
DURATION : 3 HRS

General Instructions:

- (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). Use of Calculators is not permitted

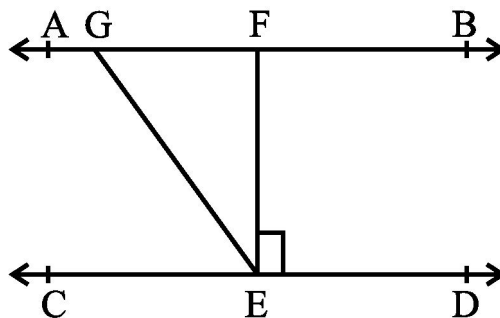
SECTION – A

1. If $x - 2$ is a factor of $x^3 - 3x + 5a$ then find the value of a .
2. Find the points where the graph of the equation $3x + 4y = 12$ cuts the x -axis and the y -axis.
3. Diagonals of a quadrilateral ABCD bisect each other. If $\angle A = 35^\circ$, determine $\angle B$.
4. Rationalize the denominator : $\frac{7 - 3\sqrt{2}}{7 + 3\sqrt{2}}$
5. Find the value of x and y in the adjacent figure.
6. Name the quadrant on which the points lying: (i) $(2, -3)$ (ii) $(-2, 3)$



SECTION – B

7. Angles of a quadrilateral are in the ratio $3 : 4 : 4 : 7$. Find all the angles of the quadrilateral.
8. In below figure, if $AB \parallel CD$, $EF \perp CD$ and $\angle GED = 126^\circ$, find $\angle AGE$, $\angle GEF$ and $\angle FGE$.



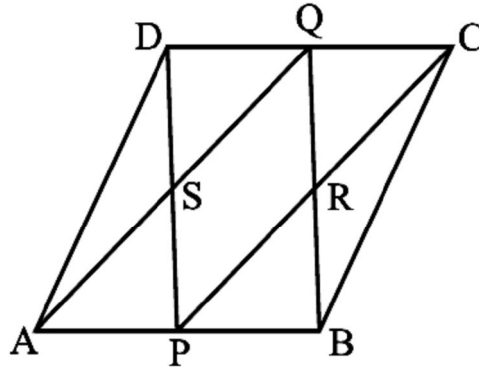
9. If both $x - 2$ and $x - \frac{1}{2}$ are factors of $px^2 + 5x + r$, show that $p = r$.
10. Prove that “Angles opposite to equal sides of an isosceles triangle are equal”
11. Show that $0.2353535\dots$ can be expressed in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

12. If A, B and C are three points on a line, and B lies between A and C (see below fig.), then prove that $AB + BC = AC$.



SECTION – C

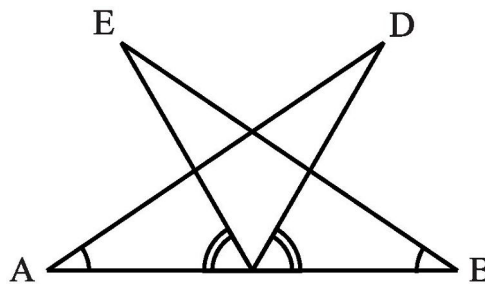
13. ABCD is a parallelogram in which P and Q are mid-points of opposite sides AB and CD (see the below figure). If AQ intersects DP at S and BQ intersects CP at R, show that:
 (i) APCQ is a parallelogram.
 (ii) DPBQ is a parallelogram.
 (iii) PSQR is a parallelogram.



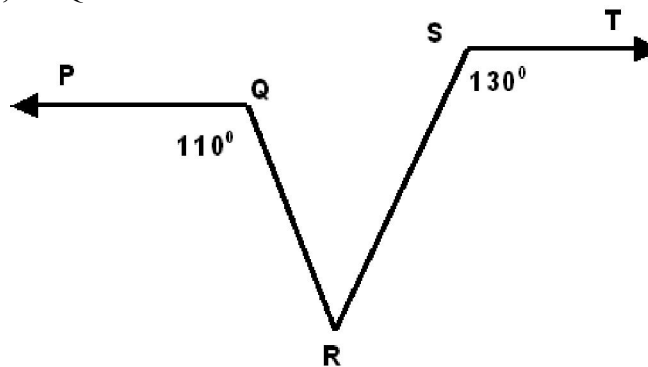
14. Find the value of a and b in $\frac{3+\sqrt{7}}{3-\sqrt{7}} = a+b\sqrt{7}$

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

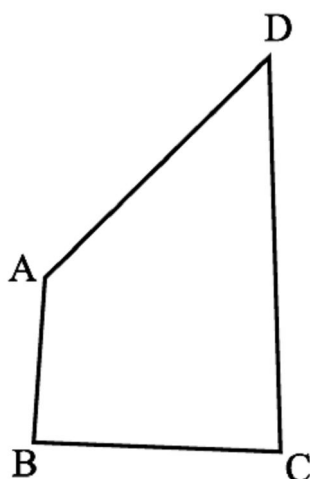
16. AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (see the below figure). Show that (i) $\triangle DAP \cong \triangle EBP$ (ii) $AD = BE$



17. In the fig, if $PQ \parallel ST$, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$ then find the value of $\angle QRS$.

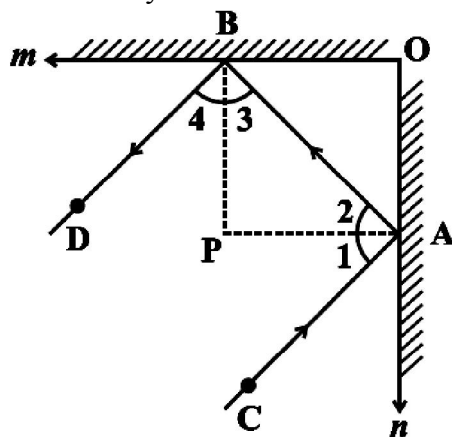


18. Solve the equation $2x + 11 = 0$, and represent the solution(s) on (i) the number line, (ii) the Cartesian plane.
19. How would you rewrite Euclid's fifth postulate so that it would be easier to understand? Does Euclid's fifth postulate imply the existence of parallel lines? Explain.
20. In a triangle ABC, E is the mid-point of median AD. Show that $\text{ar}(\text{BED}) = \frac{1}{4} \text{ar}(\text{ABC})$
21. In which quadrant or on which axis do each of the points $(-2, 4)$, $(3, -1)$, $(-1, 0)$, $(1, 2)$ and $(-3, -5)$ lie?
22. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see the below figure). Show that $\angle A > \angle C$ and $\angle B > \angle D$.



SECTION – D

23. If $x = \frac{1}{3 - \sqrt{8}}$, find the value of $x^3 - 2x^2 - 7x + 5$.
24. Prove that "If three sides of one triangle are equal to three sides of the other triangle, then the two triangles are congruent".
25. In the below figure, m and n are two plane mirrors perpendicular to each other. Show that incident ray CA is parallel to reflected ray BD.



26. P, Q, R and S are respectively the mid-points of the sides AB, BC, CD and DA of a quadrilateral ABCD such that $AC \perp BD$. Prove that PQRS is a rectangle.

27. The polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ when divided by $(x - 1)$ and $(x + 1)$ leaves the remainders 5 and 9 respectively. Find the values of a and b .
28. Points $A(5, 3)$, $B(-2, 3)$ and $D(5, -4)$ are three vertices of a square $ABCD$. Plot these points on a graph paper and hence find the coordinates of the vertex C .
29. Draw the graphs of the equations $3x - 2y = 4$ and $x + y - 3 = 0$ in the same graph paper. Find the coordinates of the point where two lines intersect.
30. In the below figure, $ABCDE$ is a pentagon. A line through B parallel to AC meets DC produced at F . Show that (i) $\text{ar}(\triangle ACB) = \text{ar}(\triangle ACF)$ (ii) $\text{ar}(\triangle AEDF) = \text{ar}(\text{pentagon } ABCDE)$

