

CBSE Class 9 Maths Sample Paper SA 1

SUBJECT: MATHEMATICS
CLASS : IX

MAX. MARKS : 80
DURATION : 3 HRS

General Instruction:

- (i) All questions are compulsory.
- (ii) This question paper contains **31** questions divided into four Sections A, B, C and D.
- (iii) **Section A** comprises of 4 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 11 questions of **4 marks** each.
- (iv) There is no overall choice.
- (v) Use of Calculators is not permitted

SECTION – A

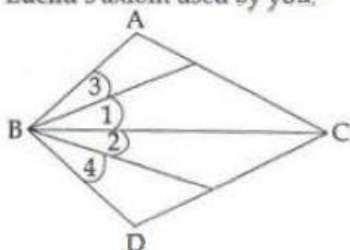
Question numbers 1 to 4 carry one mark each.

- | | | |
|---|---|---|
| 1 | Simplify : $3(3)^{\frac{1}{3}} - \sqrt[3]{3}$ | 1 |
| 2 | Using appropriate identity, factorize $9x^2 + 6x + 1$. | 1 |
| 3 | The two angles measuring $(30^\circ - a)$ and $(125^\circ + 2a)$ are supplementary to each other. Find the value of a . | 1 |
| 4 | The area of a rhombus is 84 cm^2 and one diagonal is 12 cm . Find the other diagonal of the rhombus. | 1 |

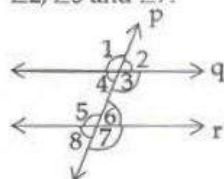
SECTION-B

Question numbers 5 to 10 carry two marks each.

- | | | |
|---|--|---|
| 5 | Express $2.\bar{8}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$. | 2 |
| 6 | Determine whether $3x - 2$ is a factor of $3x^3 + x^2 - 20x + 12$. | 2 |
| 7 | In the given figure, we have $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$. Show that $\angle ABC = \angle DCB$. State the Euclid's axiom used by you. | 2 |



- 8 In the figure, transversal p intersects two parallel lines q and r such that $\angle 3 = 120^\circ$. Find $\angle 1$, $\angle 2$, $\angle 5$ and $\angle 7$. 2

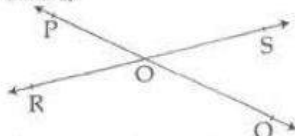


- 9 Plot the points $A(1, 0)$, $B(4, 0)$ and $C(4, 4)$. Find the co-ordinates of the point D such that $ABCD$ is a square. 2
- 10 An advertisement board is of the form of an equilateral triangle of perimeter 240 cm. Find the area of the board using Heron's formula (Use $\sqrt{3} = 1.73$) 2

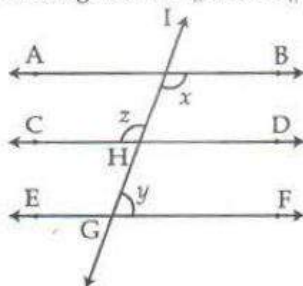
SECTION-C

Question numbers 11 to 20 carry three marks each.

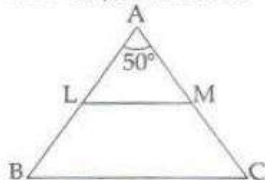
- 11 If $\frac{30}{4\sqrt{3} + 3\sqrt{2}} = 4\sqrt{3} - a\sqrt{2}$, find the value of a . 3
- 12 If $\frac{5 + \sqrt{11}}{3 - 2\sqrt{11}} = x + y\sqrt{11}$, find the values of x and y . 3
- 13 Find the value of $x^3 + y^3 + 12xy - 64$, when $x + y = 4$ 3
- 14 If $f(x) = 5x^2 - 4x + 5$, find $f(1) + f(-1) + f(0)$. 3
- 15 In the figure, lines PQ and RS intersect each other at point O . If $\angle POR : \angle ROQ = 2 : 3$, find $\angle POR$ and $\angle ROQ$. 3



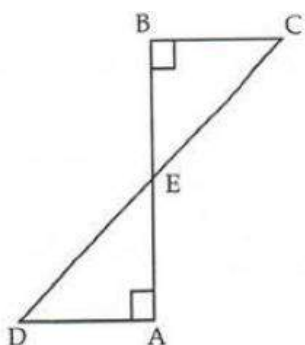
- 16 In the figure, if $AB \parallel CD$, $CD \parallel EF$ and $x : y = 5 : 4$, find z . 3



- 17 In the figure, ABC is an isosceles triangle in which $AB = AC$ and LM is parallel to BC . If $\angle A = 50^\circ$, find $\angle LMC$. 3



- 18 AD and BC are equal perpendiculars to a line segment AB (see figure). Show that CD bisects AB . 3



- 19 Plot the following ordered pairs (x, y) of numbers as points in the cartesian plane : 3

x	0	-4.5	-1	2	-3	4
y	2.5	0	3	5	-2	-6

- 20 Find the area of a field which is in the shape of a trapezium having parallel sides as 20 m and 42m and non-parallel sides as 21m and 23 m.

(Use $\sqrt{10} = 3.1$)

SECTION-D

Question numbers 21 to 31 carry four marks each.

- 21 If $a = \frac{1}{2+\sqrt{3}}$ and $b = \frac{1}{2-\sqrt{3}}$, then find $a^2 + b^2 - 14ab$. 4

- 22 If $2^x = 3^y = 6^{-z}$, then prove that $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$. 4

- 23 If $p(x) = x^3 - 4x^2 + x + 6$, then show that $p(3) = 0$ and hence factorise $p(x)$. 4

- 24 Divide the polynomial $x^4 + x^3 - 2x^2 - x + 1$ by $x + 1$ and verify remainder by using remainder theorem. 4

- 25 Factorise : $\frac{l^3}{m^3} + \frac{m^3}{n^3} + \frac{n^3}{l^3} - 3$ 4

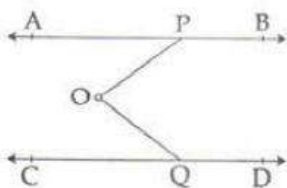
- 26 Simplify : $(x+y)^3 - (x-y)^3 - 6y(x+y)(x-y)$ 4

- 27  4

A circular pond in a village is full of fishes. Rohan everyday feeds the fishes. What value is he exhibiting by doing so ? With centre as K in the figure how many circles can be drawn ? State Euclid Axiom which supports this statement. Also give two axioms of Euclids.

- 28 Sunil and Shyam have the same weight. If they each gain weight by 5 kg, how will their new weights be compared using the axioms ? Write the Euclid's axiom that best supports your answer. Also give two more axioms other than the axiom used in the above situation. 4

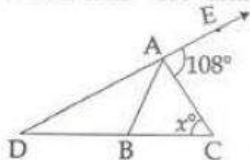
- 29 In figure $AB \parallel CD$. Prove that : $\angle BPO + \angle POQ + \angle DQO = 360^\circ$. 4



30

4

In the given figure, AB divides $\angle DAC$ in the ratio 1 : 3. DA is produced to the point E such that $\angle CAE = 108^\circ$ and $AB = DB$. Determine the value of x .



31

4

In the given figure, ABCD is a square and EF is parallel to diagonal BD. If $EM = FM$, prove that :

- (i) $DF = BE$.
- (ii) AM bisects $\angle BAD$.

