

# CBSE Class 9 Maths Sample Paper

**SUBJECT: MATHEMATICS**  
**CLASS : IX**

**MAX. MARKS : 80**  
**DURATION : 3 HRS**

## General Instruction:

- All questions are compulsory.
- This question paper contains **30** questions divided into four Sections A, B, C and D.
- 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.
- There is no overall choice. However, an internal choice has been provided in two questions in 1 mark each, two questions in 2 marks each, 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.
- Use of Calculators is not permitted

## SECTION – A

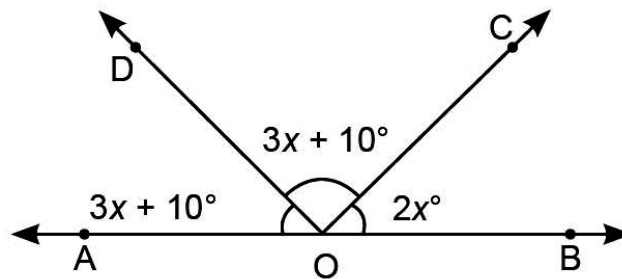
Questions 1 to 6 carry 1 mark each.

- What will be the ratio of areas of the two parallelogram which lie on same base and between the same parallels?
- Give one example each of a binomial of degree 35 and of a monomial of degree 100.
- In which quadrant points  $(1, -1)$ ,  $(2, -2)$ ,  $(4, -5)$  and  $(3, -4)$  lie?
- Simplify:  $\sqrt{72} + \sqrt{800} - \sqrt{18}$

OR

Simplify:  $343^{\frac{1}{3}}$

- Find the value of  $x$ , so that AOB is a line.



- The following data have been arranged in ascending order of their values. 19, 20, 36, 46, 50,  $x - 2$ ,  $x + 4$ , 59, 70, 80, 83, 88. If the median is 57 find  $x$ .

OR

Find the mean of the factors of 24.

## SECTION – B

Questions 6 to 12 carry 2 marks each.

- If each side of a cube is 10 cm. Find its surface area and lateral surface area.

OR

The diameters of two cones are equal. If their slant heights are in the ratio 7 : 4, find the ratio of their curved surface area.

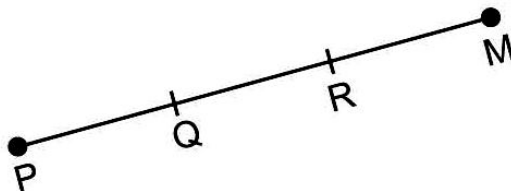
8. Two coins are tossed simultaneously 100 times and we get two heads 25 times, one head 40 times and no head 35 times. Find the probability of occurrence of each of these events.

OR

12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.

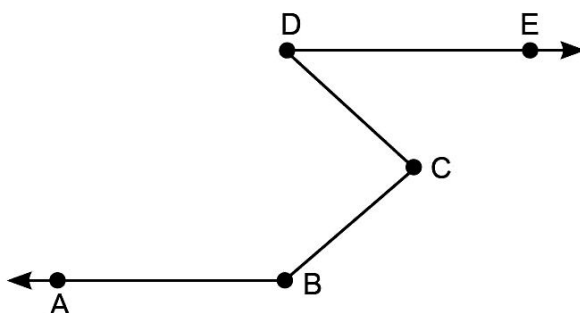
9. Find the value of the polynomial  $2y^2 - 3y - 4$  at (i)  $y = 5$  (ii)  $y = -2$ .

10. In the given figure, if  $PQ = RM$ ; prove that  $PR = QM$ .



11. In quadrilateral PQRS,  $\angle P : \angle Q : \angle R : \angle S = 3 : 4 : 5 : 6$ . Find all the angles of the quadrilateral.

12. In the given figure,  $AB \parallel DE$ . Prove that  $\angle ABC + \angle BCD = 180^\circ + \angle CDE$ .

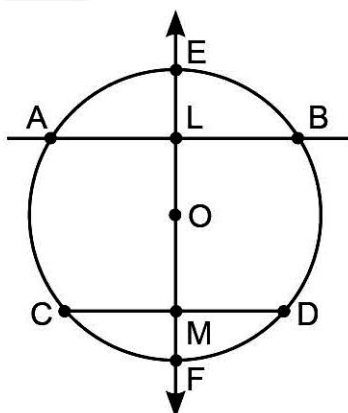


### SECTION – C

Questions 13 to 22 carry 3 marks each.

13. Simplify  $\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} + \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}}$  by rationalizing the denominator.

14. In the given figure, EF is a line passing through the centre O of a circle. If EF bisects chord AB and CD of the circle, prove that  $AB \parallel CD$ .



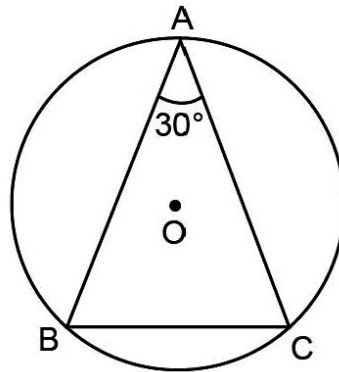
15. Draw the graph of the equation  $x + 9y = 15$ . Find the coordinates of the point where the graph intersects the x-axis.

16. Plot the following points on a graph paper: A(2, -5), B(8, 9), C(-5, 4), D(0, 0), E(-5, -3).

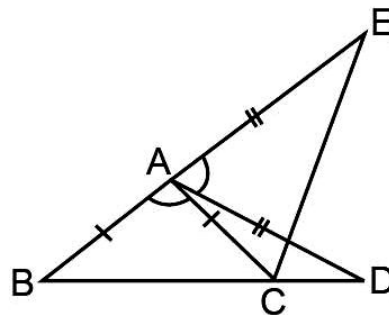
17. ABCD is a parallelogram. The circles through A, B and C intersect CD (produced, if necessary) at E. Prove that  $AE = AD$ .

OR

In the given figure, ABC is a triangle in which  $\angle BAC = 30^\circ$ . Show that BC is equal to the radius of the circumcircle of  $\triangle ABC$ , whose centre is O.

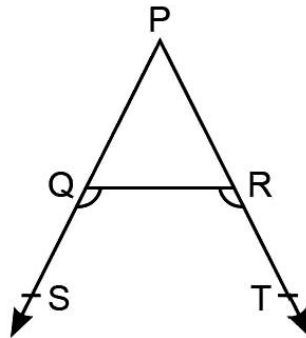


18. In the given figure,  $AB = AC$ ,  $AD = AE$  and  $\angle BAC = \angle DAE$ . Prove that  $\triangle BAD \cong \triangle CAE$ .

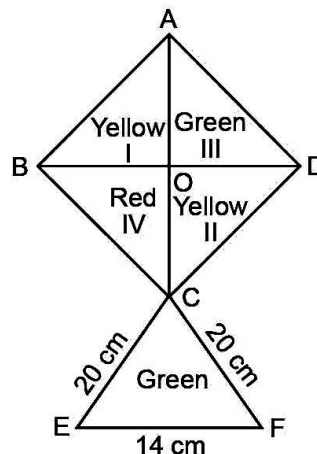


OR

In the given figure, the sides PQ and PR are produced to S and T respectively and  $\angle SQR < \angle TRQ$ . Prove that  $PR > PQ$ .



19. How much paper of each shade is needed to make a kite given in figure, in which ABCD is a square with diagonal 44 cm?



20. Factorise:  $9x^2 - 12ax - y^2 - z^2 - 2yz + 4a^2$

OR

If  $z^2 + \frac{1}{z^2} = 34$ , find the value of  $z^3 + \frac{1}{z^3}$  using only the positive value of  $z + \frac{1}{z}$ .

21. ABCD is a rectangle in which diagonal AC bisects  $\angle A$  and  $\angle C$ . Prove that ABCD is square.

22. 1500 families with 2 children were selected randomly and the following data were recorded:

No. of girls in family	2	1	0
No. of families	475	814	211

Compute the probability having (a) Two girls (b) One girl (c) No girl

OR

A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be (i) red ? (ii) white ? (iii) not green?

### SECTION – D

Questions 23 to 30 carry 4 marks each.

23. If  $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$  and  $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ , then find the value of  $x^2 + y^2 - 5xy$ .

OR

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. If  $2x^3 + ax^2 - bx - 15$  has  $2x + 3$  as a factor and leaves a remainder  $-5$  when divided by  $(x - 1)$ , find the values of  $a$  and  $b$ .

25. The linear equation that converts Fahrenheit ( $^{\circ}\text{F}$ ) to Celsius ( $^{\circ}\text{C}$ ) is given by the relation:

$$^{\circ}\text{C} = \frac{5^{\circ}\text{F} - 160}{9}$$

(i) If the temperature is  $95^{\circ}\text{F}$ , what is the temperature in Celsius?

(ii) If the temperature is  $30^{\circ}\text{C}$ , what is the temperature in Fahrenheit?

(iv) What is the numerical value of the temperature which is same in both the scale?

(iv) Find  $^{\circ}\text{F}$ , if  $^{\circ}\text{C} = 0$ .

26. Construct a  $\triangle ABC$  in which  $BC = 6$  cm,  $\angle B = 60^{\circ}$  and the sum of other two sides is 9 cm.

27. If  $D, E, F$  are the mid-points of the sides  $BC, CA$  and  $AB$  respectively of  $\triangle ABC$ , prove that  $BDEF$  is a parallelogram whose area is half to that of  $\triangle ABC$ . Show that  $\text{ar}(\triangle DEF) = \frac{1}{4} \text{ar}(\triangle ABC)$ .

28. Sanya has a piece of land which is in the shape of a rhombus. She wants her one daughter and one son to work on the land and produce different crops to suffice the needs of their family. She divided the land in two equal parts. If the perimeter of the land is 400 m and one of the diagonal is 160 m, how much area each of them will get?

29. The radius and height of a right circular cone are in the ratio 4 : 3 and its volume is 2156 cu. cm. Find the curved surface area and the total surface area of the cone.

**OR**

Find the area of an isosceles triangle whose one side is 10 cm greater than each of its equal sides and perimeter is 100 cm.

30. The table given below shows the frequency distribution of the scores obtained by 200 candidates in a BCA entrance examination:

Scores	Number of Candidates
200 - 250	30
250 - 300	15
300 - 350	45
350 - 400	20
400 - 450	25
450 - 500	40
500 - 550	10
550 - 600	15

- (i) Determine the class limit of third class interval.  
(ii) Determine the class size.  
(iii) Determine the class marks of sixth class interval.  
(iv) How many candidates are in the range of score 350 to 600?

**OR**

Draw a histogram and frequency polygon on the same graph for the following data.

Class Interval	Frequency
150 - 200	5
200 - 250	3
250 - 300	5
300 - 350	6
350 - 400	8
400 - 450	7
450 - 500	1

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