

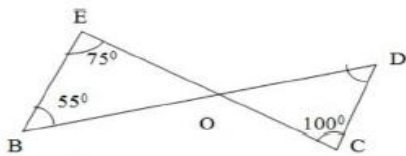
Sample Question Paper of class IX (Mathematics)

General Instructions:

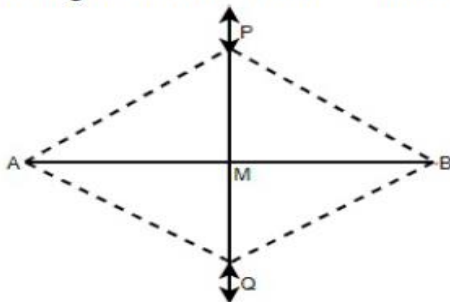
- i. All the questions are compulsory.
- ii. The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
- iii. Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
- iv. There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three 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

1. If $3^x + 64 = 2^6 + (\sqrt{3})^8$, then the value of 'x' is
 - a. 4
 - b. 2
 - c. 3
 - d. 1
2. If $x + y = 8$ and $xy = 15$, then $x^2 + y^2$
 - a. 34
 - b. 1
 - c. 32
 - d. 36
3. In the given figure, $\angle OEB = 75^\circ$, $\angle OBE = 55^\circ$ and $\angle OCD = 100^\circ$. Then $\angle ODC = ?$



- a. 30°
 - b. 25°
 - c. 35°
 - d. 20°
4. In the construction of the perpendicular bisector of a given line segment, as shown in the figure below $\triangle PBM \cong \triangle PMB$ by which congruence criterion?



- a. SSS
- b. AAS
- c. SAS
- d. RHS

5. If both $(x + 2)$ and $(2x + 1)$ are factors of $ax^2 + 2x + b$, then the value of $a - b$ is
- 1
 - 2
 - 1
 - 0
6. The figure obtained by joining the mid-points of the adjacent sides of a rectangle of sides 8 cm and 6 cm is
- a rectangle of area 24 cm^2
 - a trapezium of area 14 cm^2 .
 - a square of area 26 cm^2 .
 - a rhombus of area 24 cm^2 .
7. If $x^2 + 3mx + 6$, then the value of 'm' is
-
- 0
 - $\sqrt{3}$
 - 3
 - 1
8. The perimeter of a rhombus is 20 cm. One of its diagonals is 8 cm. Then area of the rhombus is
- 24 cm^2
 - 18 cm^2
 - 14 cm^2
 - 36 cm^2
9. The curved surface area of a right circular cylinder which just encloses a sphere of radius r is
- $2\pi r^2$.
 - $4\pi r^2$.
 - $8\pi r^2$.
 - $6\pi r^2$.
10. The probability of a sure event is
- 1
 - more than 1
 - less than 1
 - between 0 and 1
11. Fill in the blanks:
- $(27)^{-2/3}$ is equal to _____.
12. Fill in the blanks:
- $x - 4$ is the equation of a line parallel to _____.

OR

Fill in the blanks:

$y + 7$ is the equation of a line parallel to _____

13. Fill in the blanks:

The y-coordinate is also called the _____.

14. Fill in the blanks:

The region between a chord and either of the arc is called a _____.

15. Fill in the blanks:

The surface area of a sphere is $676\pi \text{ cm}^2$, then its radius is _____.

16. If $x = 2 + \sqrt{3}$, find the value of $x^2 + \frac{1}{x^2}$.

17. Factorize: $x^4 + 4$

18. The radius of sphere is $2r$, then find its volume.

OR

The volume of a cuboid is 440 cm^3 and the area of its base is 88 cm^2 . Find its height.

19. Can the angles 110° , 80° , 70° and 95° be the angles of a quadrilateral? Why or why not?

20. Find the co-ordinate where the equation $2x + 3y = 6$ intersects x-axis.

21. Prove that: $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \frac{1}{\sqrt{4}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}} + \frac{1}{\sqrt{8}+\sqrt{9}} = 2$

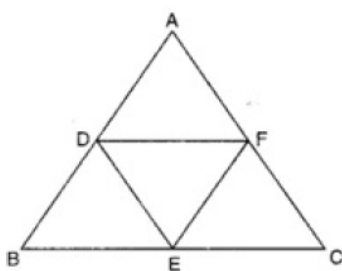
22. Find the value of the following equation for $x = 1$, $y = 1$ as a solution. $5x + 3y = a$

23. Evaluate the following using suitable identities : $(998)^3$

OR

Factorize: $2(x + y)^2 - 9(x + y) - 5$

24. Mr Sharma explains his four children two boys and two girls about distribution of his property among them by a picture of triangle ABC such that D, E, F are mid-points of sides AB, BC, CA respectively are joined to divide triangle ABC in four triangles as shown in figure.



If total property is equal to area of $\triangle ABC$ and share of each child is equal to area of each of four triangles, what does each child has share?

25. The class marks of a distribution are 47, 52, 57, 62, 67, 72, 77, 82 Determine the
 (i) class size
 (ii) class limits
 (iii) true class limits.

OR

A random survey of the number of children of various age group playing in the park was found:

Age [in years]	1 - 2	2 - 3	3 - 5	5 - 7	7 - 10
No. of children	3	5	7	10	13

Draw a histogram to represent the data above?

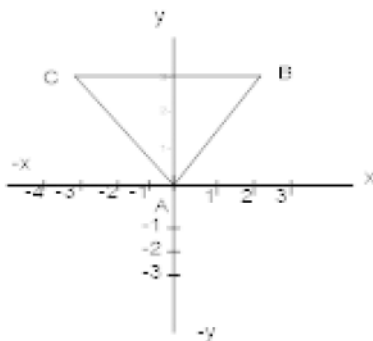
26. The students of a Vidyalaya were asked to participate in a competition, for making and decorating penholders in the shape of a cylinder with a base, using cardboard. Each penholder was to be of radius 3cm and height 10.5cm. The Vidyalaya was to supply competitors with cardboard. If there were 35 competitors, how much cardboard was required to be bought for the competition?

27. Rationalize the denominator of the following : $\frac{3+\sqrt{2}}{3-\sqrt{2}}$

OR

Simplify the following: $\frac{1}{2+\sqrt{3}} + \frac{2}{\sqrt{5}-\sqrt{3}} + \frac{1}{2-\sqrt{5}}$

28. In fig find the vertices' coordinates of $\triangle ABC$



29. Write two solutions for the following equation: $3x + 4y = 7$

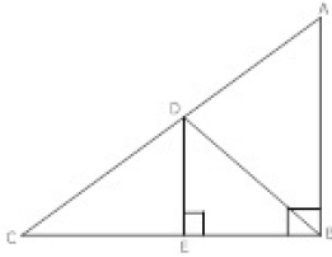
OR

Draw the graph of $y = |x|$.

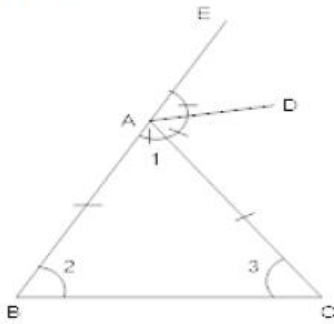
30. Draw a circle with centre at point O. Draw its two chords AB and CD such that AB is not parallel to CD. Draw the perpendicular bisectors of AB and CD. At what point do they intersect?

31. In fig $\angle B$ is a right angle in $\triangle ABC$ and D is the mid-point of AC . Also, $DE \parallel AB$ and DE intersects BC at E . show that

- i. E is the mid-point of BC
- ii. $DE \perp BC$
- iii. $BD = AD$

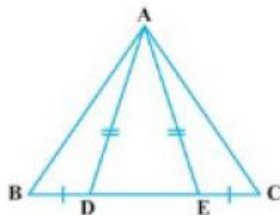


32. $\triangle ABC$ is an isosceles triangle with $AB = AC$. AD bisects the exterior $\angle A$. prove that $AD \parallel BC$.



OR

In the given figure, D and E are points on side BC of a $\triangle ABC$ such that $BD = CE$ and $AD = AE$. Show that $\triangle ABD \cong \triangle ACE$.



33. The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 13 m, 14 m and 15 m. The advertisements yield an earning of Rs2000 per m^2 a year. A company hired one of its walls for 6 months. How much rent did it pay?
34. 1500 families with 2 children were selected randomly and the following data were recorded:

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

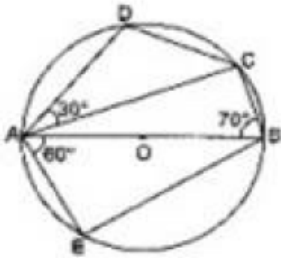
Compute the probability of a family, chosen at random, having:

- (i) 2 girls
- (ii) 1 girl

(iii) No girl

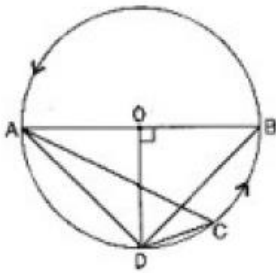
Also, check whether the sum of these probabilities is 1

35. In figure, AB is a diameter of a circle with centre O. If $\angle ABC = 70^\circ$, $\angle CAD = 30^\circ$ and $\angle BAE = 60^\circ$, find $\angle BAC$, $\angle ACD$ and $\angle ABE$

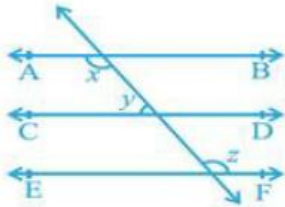


OR

In the given figure, AB is a diameter of the circle $C(O, r)$ and radius OD is perpendicular to AB. If C is any point on DB, find $\angle BAD$ and $\angle ACD$.



36. In the given figure, if $AB \parallel CD$, $CD \parallel EF$ and $y : z = 3 : 7$, find x.



37. Check whether $p(x)$ is a multiple of $g(x)$ or not:

- $p(x) = x^3 - 5x^2 + 4x - 3, g(x) = x - 2$
- $p(x) = 2x^3 - 11x^2 - 4x + 5, g(x) = 2x + 1$

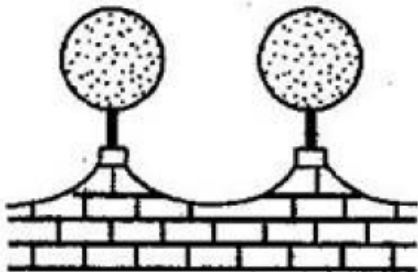
OR

Prove that $(a + b + c)^3 - a^3 - b^3 - c^3 = 3(a + b)(b + c)(c + a)$

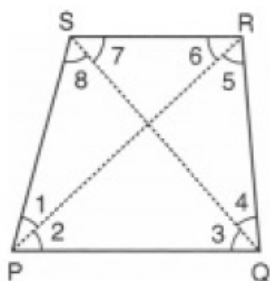
38. What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6 m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. (Use $\pi = 3.14$)

OR

The front compound wall of a house is decorated by wooden spheres of diameter 21 cm, placed on small supports as shown in figure. Eight such spheres are used for this purpose and are to be painted silver. Each support is a cylinder of radius 1.5 cm and height 7 cm and is to be painted black. Find the cost of paint required if silver paint costs 25 paise per cm^2 and black paint costs 5 paise per cm^2



39. In Fig., PQRS is a quadrilateral. PQ is its longest side and RS is its shortest side. Prove that $\angle R > \angle P$ and $\angle S > \angle Q$.



40. The following table gives the distribution of students of two sections according to the marks obtained by them:

Section A		Section B	
Marks	Frequency	Marks	Frequency
0-10	3	0-10	5
10-20	9	10-20	19
20-30	17	20-30	15
30-40	12	30-40	10
40-50	9	40-50	1

Represent the marks of the students of both the sections on the same graph by frequency polygons.