Sample Paper 08

Class - 10th Exam - 2026 - 27

Mathematics - Basic

Time : 3 Hours **Max. Marks : 80**

General Instructions :

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion - Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = \frac{22}{7}$ wherever required if not stated.
11. Use of calculators is not allowed.

SECTION - A

Section A consists of 20 questions of 1 mark each.

1. In a circle of radius 14 cm, an arc subtends an angle of 45° at the centre, then the area of the sector is

(a) $71\,cm^2$ (b) $76\,cm^2$

(c) $77\,cm^2$ (d) $154\,cm^2$

2. During conversion of a solid from one shape to another, the volume of the new shape will

(a) Increase

(b) Decrease

(c) Remain unaltered

(d) Be doubled

3. Two concentric circles of radii a and b where $a > b$,The length of a chord of the larger circle which touches the other circle is

(a) $\sqrt{a^2+b^2}$ (b) $2\sqrt{a^2+b^2}$

(c) $\sqrt{a^2-b^2}$ (d) $2\sqrt{a^2-b^2}$

4. One equation of a pair of dependent linear equations $-5x+7y=2$ The second equation can be

(a) $10x+14y+4=0$

(b) $-10x-14y+4=0$

(c) $-10x+14y+4=0$

(d) $10x-14y=-4$

5. The angles of elevation of the top of a tower from the points P and Q at distance of a and b respectively from the base and in the same straight line with it, are complementary. The height of the tower is

(a) ab (b) $\sqrt{ab}$

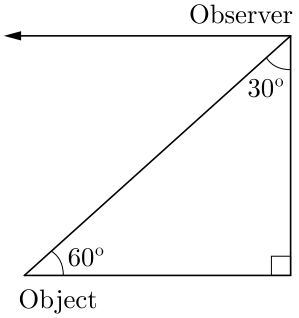
(c) $\sqrt{\frac{a}{b}}$ (d) $\sqrt{\frac{b}{a}}$

6. There are 1000 sealed envelopes in a box. 10 of them contain a cash prize of ₹ 100 each, 100 of them contain a cash prize of ₹ 50 each and 200 of them contain a cash prize of ₹ 10 each and rest do not contain any cash prize. If they are well-shuffled and an envelope is picked up out, then the probability that is contains no cash prize is

(a) 0.65 (b) 0.69

(c) 0.54 (d) 0.57

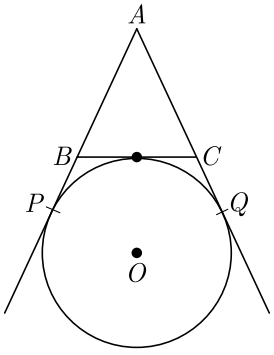
7. In the given figure, the positions of the observer and the object are mentioned, the angle of depression is



(a) 30° (b) 90°

(c) 60° (d) 45°

8. In figure, AP, AQ and BC are tangents of the circle with centre O. If $AB = 5$ cm, $AC = 6$ cm and $BC = 4$ cm, then the length of AP (in cm) is



(a) 15 (b) 10

(c) 9 (d) 7.5

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9. If $\sin\theta + \cos\theta = \sqrt{2}\cos\theta$, $(\theta \neq 90^\circ)$ then the value of $\tan\theta$ is

(a) $\sqrt{2}-1$ (b) $\sqrt{2}+1$

(c) $\sqrt{2}$ (d) $-\sqrt{2}$

10. Which of the following equations has the sum of its roots as 3 ?

(a) $2x^2-3x+6=0$ (b) $-x^2+3x-3=0$

(c) $\sqrt{2}\,x^2-\dfrac{3}{\sqrt{2}}x+1=0$ (d) $3x^2-3x+3=0$

11. If X, M and Z are denoting mean, median and mode of a data and $X:M=9:8$, then the ratio $M:Z$ is

(a) 3 : 4 (b) 4 : 9

(c) 4 : 3 (d) 2 : 5

12. There are 60 terms is an AP of which the first term is 8 and the last term is 185. The 31^{st} term is

(a) 56 (b) 94

(c) 85 (d) 98

13. It is given that, $\Delta ABC \sim \Delta EDF$ such that $AB=5$ cm, $AC=7$ cm, $DF=15$ cm and $DE=12$ cm then the sum of the remaining sides of the triangles is

(a) 23.05 cm (b) 16.8 cm

(c) 6.25 cm (d) 24 cm

14. An event is very unlikely to happen. Its probability is closest to

(a) 0.0001 (b) 0.001

(c) 0.01 (d) 0.1

15. The quadratic equation $x^2+3x+2\sqrt{2}=0$ has

(a) Two distinct real roots

(b) Two equal real roots

(c) No real roots

(d) More than 2 real roots

16. If triangle ABC is similar to triangle DEF such that $2AB=DE$ and $BC=8$ cm then find EF.

(a) 16 cm (b) 14 cm

(c) 12 cm (d) 15 cm

17. If radii of two concentric circles are 4 cm and 5 cm, then the length of each of one circle which is tangent to the other circle, is

(a) 3 cm (b) 6 cm

(c) 9 cm (d) 1 cm

18. Observations of some data are $\frac{x}{5}$, x, $\frac{x}{3}$, $\frac{2x}{3}$, $\frac{x}{4}$, $\frac{2x}{5}$ and $\frac{3x}{4}$ where $x>0$. If the median of the data is 4, then the value of x is

(a) 5 (b) 15

(c) 9 (d) 10

19. **Assertion :** $\sin^2 67^\circ + \cos^2 67^\circ = 1$
Reason : For any value of $\theta, \sin^2\theta + \cos^2\theta = 1$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

20. **Assertion :** $p(x) = 14x^3 - 2x^2 + 8x^4 + 7x - 8$ is a polynomial of degree 3.
Reason : The highest power of x in the polynomial $p(x)$ is the degree of the polynomial.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

SECTION - B

Section B consists of 5 questions of 2 marks each.

21. If S_n denotes the sum of n terms of an AP whose common difference is d and first term is a, find $S_n - 2S_{n-1} + S_{n-2}$.

OR

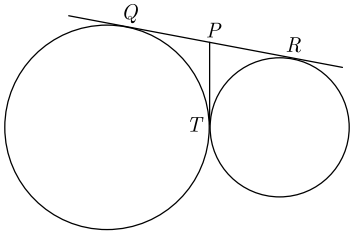
Find the sum of first 15 multiples of 8.

22. The ordinate of a point A on y-axis is 5 and B has co-ordinates $(-3, 1)$. Find the length of AB.

23. Two circles of radii 20 cm and 37 cm intersect in A and B. If O_1 and O_2 are their centres and $AB = 24$ cm, then find the distance O_1O_2.

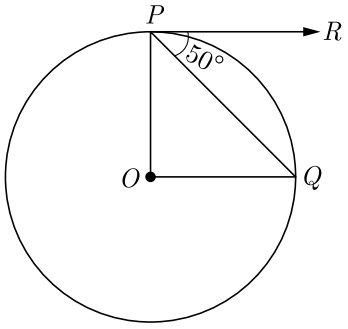
OR

In the figure, QR is a common tangent to given circle which meet at T. Tangent at T meets QR at P. If $QP = 3.8$ cm, then find length of QR.



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24. If O is centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ, find $\angle POQ$.



25. Prove that $3+\sqrt{5}$ is an irrational number.

SECTION - C

Section C consists of 6 questions of 3 marks each.

26. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting :
(i) A non face card,
(ii) A black king.

27. Prove that $\left(\sin\theta+\operatorname{cosec}\theta\right)^2+\left(\cos\theta+\sec\theta\right)^2=7+\tan^2\theta+\cot^2\theta$

28. State Fundamental theorem of Arithmetic. Find LCM of numbers 2520 and 10530 by prime factorization.

OR

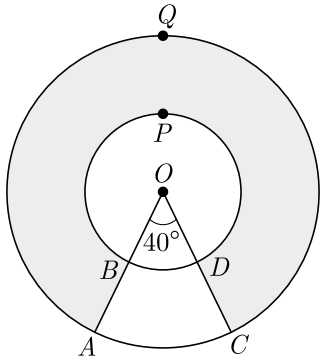
Every composite number can be expressed as the product powers of primes and this factorization is unique.

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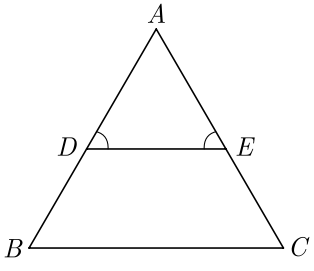
29. Find the area of minor segment of a circle of radius 14 cm, when its centre angle is 60°. Also find the area of corresponding major segment. Use $\pi = \frac{22}{7}$.

OR

In the given figure, find the area of the shaded region, enclosed between two concentric circles of radii 7 cm and 14 cm where $\angle AOC = 40^\circ$. Use $\pi = \frac{22}{7}$.



30. In Figure $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$, prove that ΔBAC is an isosceles triangle.



31. Two different dice are tossed together. Find the probability:

(i) of getting a doublet

(ii) of getting a sum 10, of the numbers on the two dice.

OR

An integer is chosen at random between 1 and 100. Find the probability that it is:

(i) divisible by 8.

(ii) not divisible by 8.

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SECTION - D

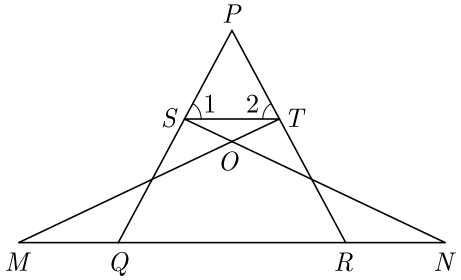
Section D consists of 4 questions of 5 marks each.

32. Solve the following pair of linear equations graphically:
$x - y = 1,\ 2x + y = 8$
Also find the co-ordinates of the points where the lines represented by the above equation intersect $y-$ axis.

OR

Find the value of p and q for which the system of equations represent coincident lines $2x + 3y = 7$, $(p + q + 1)x + (p + 2q + 2)y = 4(p + q) + 1$

33. In given figure $\angle 1 = \angle 2$ and $\Delta NSQ \sim \Delta MTR$, then prove that $\Delta PTS \sim \Delta PRO$.



OR

Prove that in a right triangle, the square of the hypotenuse is equal to sum of squares of other two sides. Using the above result, prove that, in rhombus $ABCD$, $4AB^2 = AC^2 + BD^2$.

34. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and the diameter of the base is 4 cm. Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volume of the cylinder and toy. (Use $\pi = 3.14$)

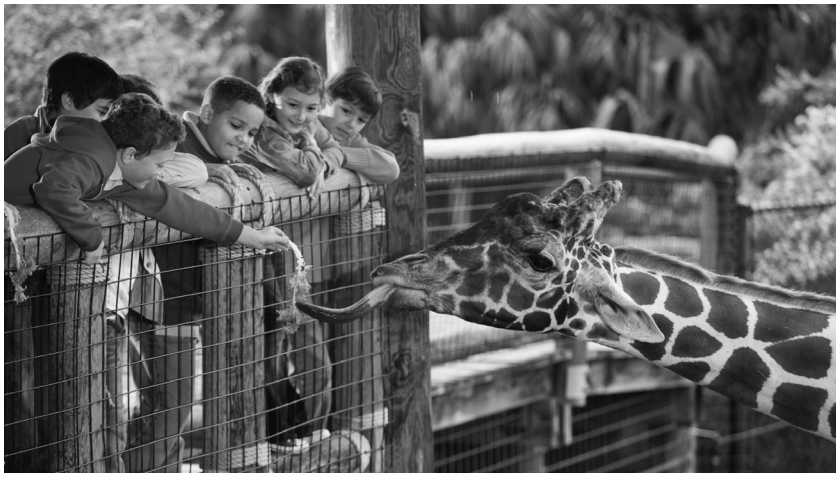
35. If $P(2, -1)$, $Q(3, 4)$, $R(-2, 3)$ and $S(-3, -2)$ be four points in a plane, show that $PQRS$ is a rhombus but not a square.

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SECTION - E

Section E consists of 3 case study based questions of 4 marks each.

36. Raju and his classmates planned a picnic in zoo. The total budget for picnic was Rs 2000 but 5 students failed to attend the picnic and thus the contribution for each student was increased by Rs 20.



The expanse of different item was as follows.

S. No.	Article	Cost per student
1	Entry ticket	Rs 5
2	Coffee	Rs 10
3	Food	Rs 25
4	Travelling cost	Rs 50
5	Ice-cream	Rs 15

(i) If x is the number of students planned for picnic, find the quadratic equation that describe the situation.

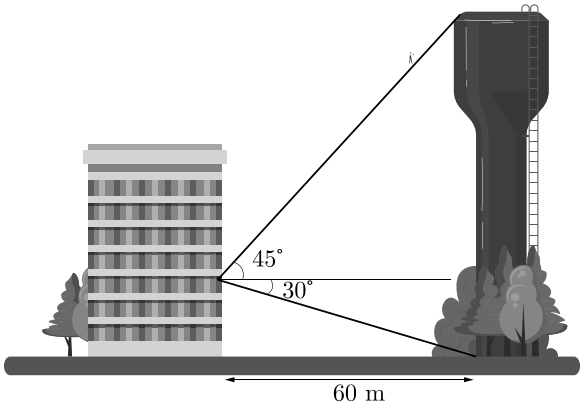
(ii) What is the number of students planned for picnic ?

(iii) What is the number of students who attended the picnic? What is the total expanse for this picnic ?

(iv) How much money they spent for travelling ?

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37. Water Tower : A water tower is a building that is used to hold and give out water. It is almost always built on a high place. It works because a pump gives water to the tower, and gravity makes the saved water go out to the places that need water. Those places are connected to the tower by pipes. A water tower is good when there is no power because it uses gravity to send out the water.



A water tower is located 60 meter from a building (see the figure). From a window in the building, an observer notes that the angle of elevation to the top of the tower is 60° and that the angle of depression to the bottom of the tower is 30°.

(i) How tall is the tower?

(ii) How high is the window?

38. The Kendriya Vidyalaya Sangathan is a system of premier central government schools in India that are instituted under the aegis of the Ministry of Education (MHRD), Government of India. As of October 2020, it has a total of 1239 schools. It is one of the world's largest chains of schools. The system came into being in 1963 under the name 'Central Schools'. Later, the name was changed to Kendriya Vidyalaya. Its schools are all affiliated to the Central Board of Secondary Education (CBSE). The objective of KVS is to cater to the educational needs of the children of transferable Central Government employees including Defence and Para-Military personnel by providing a common programme of education.



Commissioner of Regional office Jaipur prepare a table of the marks obtained of 100 students which is given below

Marks obtained	0-20	20-40	40-60	60-80	80-100
Number of students	15	18	21	29	p

He was told that mean marks of a student is 53.

(i) How many students got marks between 80-100?

(ii) What is the lower limit of model class ? What is the value of model marks ?

(iii) What is the value of median marks ? What is the upper limit of median class ?

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