Sample Paper 26

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 an AP, if $d = -4$, $n = 7$ and $a_n = 4$, then a is equal to

(a) 6 (b) 7

(c) 20 (d) 28

2. If sum of the zeroes of the quadratic polynomial $3x^2 - kx + 6$ is 3, then the value of k will be

(a) 1 (b) 4

(c) 6 (d) 9

3. The sum of exponents of prime factors in the prime-factorisation of 1764 is

(a) 3 (b) 4

(c) 5 (d) 6

4. Select the quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $f(x) = ax^2 + bx + c$, $a \neq 0$, $c \neq 0$.

(a) $bx^2 + ax + c$

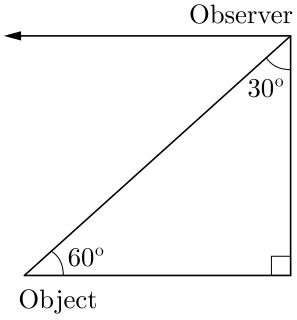
(b) $ax^2 + cx + b$

(c) $cx^2 + bx + a$

(d) $bx^2 + cx + a$

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5. 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°

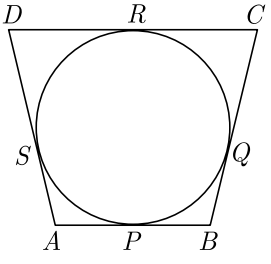
6. Volume of a spherical shell is given by
(a) $4\pi(R^2 - r^2)$ (b) $\pi(R^3 - r^3)$
(c) $4\pi(R^3 - r^3)$ (d) $\frac{4}{3}\pi(R^3 - r^3)$

7. For the following distribution.

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

The sum of lower limits of the median class and modal class is
(a) 15 (b) 25
(c) 30 (d) 35

8. In the given figure, a circle touches all the four sides of quadrilateral $ABCD$ with $AB = 6\,\text{cm}$, $BC = 7\,\text{cm}$ and $CD = 4\,\text{cm}$, then length of AD is



(a) 3 cm (b) 4 cm
(c) 5 cm (d) 6 cm

9. If a and b are the zeroes of polynomial $x^2 + ax + b$, the values of a and b are
(a) 1 and 2 (b) 1 and –2
(c) –2 and 1 (d) 2 and 1

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10. A bag contains 6 red and 5 blue balls. What is the probability that the ball drawn is not red?

(a) $\frac{5}{11}$ (b) $\frac{6}{11}$

(c) $\frac{2}{11}$ (d) $\frac{7}{11}$

11. The quadratic equation $x^2 - 4x + 3\sqrt{2} = 0$ has

(a) Two distinct real roots

(b) Two equal real roots

(c) No real roots

(d) More than 2 real roots

12. Select the value of k for which the pair of Linear equations $kx + y = d^2$ and $x + ky = 1$ have infinitely many solutions.

(a) 1 (b) 2

(c) 3 (d) 4

13. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, then the corresponding side of second triangle is ..... .

(a) 4.2 cm (b) 5.4 cm

(c) 20 cm (d) 6 cm

14. The distance of a point $P(x, y)$ from the origin is

(a) $\sqrt{x^2 - xy + y^2}$ (b) $\sqrt{x^2 + xy + y^2}$

(c) $\sqrt{x^2 + y^2}$ (d) $\sqrt{x^2 + 3xy + y^2}$

15. What do you say about the lines represented by $2x + y = 3$ and $4x + 2y = 6$?

(a) lines are parallel

(b) lines are coincident

(c) lines are intersecting

(d) can't say anything

16. In a triangle ABC, $\cos\left(\frac{B + C}{2}\right)$ will be

(a) $\sin\frac{A}{4}$ (b) $\cos A$

(c) $\sin\frac{A}{2}$ (d) $\cos\frac{A}{2}$

17. $\frac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A} = ?$

(a) $\sin A$ (b) $\tan A$

(c) $\cos A$ (d) $\cot A$

18. The sum of first 16 terms of the AP 10, 6, 2, ... is

(a) -320 (b) 320

(c) -352 (d) -400

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19. **Assertion :** In a circle of radius 6 cm, the angle of a sector 60°. Then the area of the sector is $18\frac{6}{7}$ cm^2.
Reason : Area of the circle with radius r is πr^2.

(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 :** The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are imaginary.
Reason : If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are imaginary.

(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

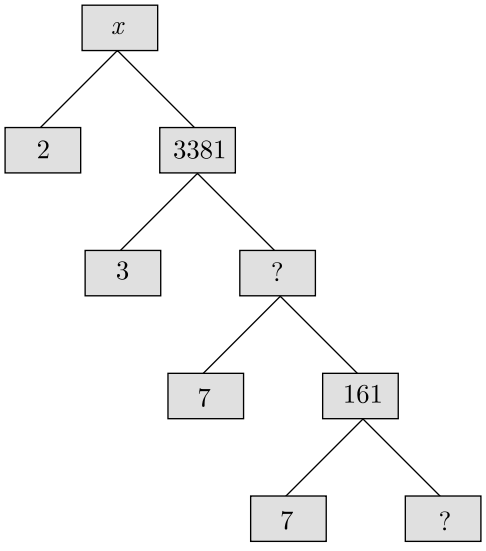
Section B consists of 5 questions of 2 marks each.

21. A letter of English alphabet is chosen at random, find the probability that the letter so chosen is :

(i) a vowel,

(ii) a consonant.

22. Complete the following factor tree and find the composite number x.



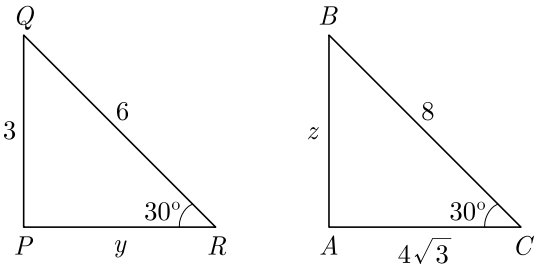
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23. If one zero of the polynomial $2x^2+3x+\lambda$ is $\frac{1}{2}$, find the value of λ and the other zero.

OR

Find the value of k such that the polynomial $x^2-(k+6)x+2(2k+1)$ has sum of its zeros equal to half of their product.

24. In the given figure, $\Delta ABC \sim \Delta PQR$. Find the value of $y+z$.

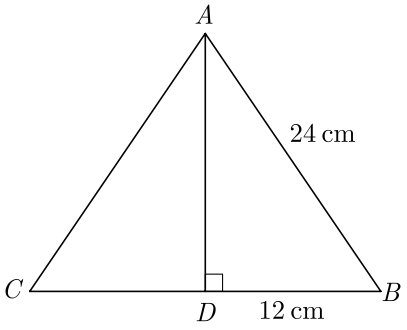


OR

In an equilateral triangle of side 24 cm, find the length of the altitude.

OR

Let ΔABC be an equilateral triangle of side 24 cm and AD is altitude which is also a perpendicular bisector of side BC. This is shown in figure given below.



25. If the centre of a circle is (3, 5) and end points of a diameter are (4, 7) and (2, y), what is the value of y ?

SECTION - C

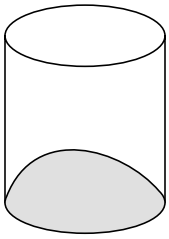
Section C consists of 6 questions of 3 marks each.

26. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

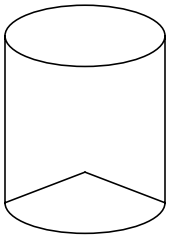
27. 144 cartons of Coke cans and 90 cartons of Pepsi cans are to be stacked in a canteen. If each stack is of the same height and if it equal contain cartons of the same drink, what would be the greatest number of cartons each stack would have ?

28. If $\tan 2A = \cot(A - 18^\circ)$, where $2A$ is an acute angle, find the value of A.

29. Isha is 10 years old girl. On the result day, Isha and her father Suresh were very happy as she got first position in the class. While coming back to their home, Isha asked for a treat from her father as a reward for her success. They went to a juice shop and asked for two glasses of juice.
Aisha, a juice seller, was serving juice to her customers in two types of glasses.
Both the glasses had inner radius 3 cm. The height of both the glasses was 10 cm.
First Type : A glass with hemispherical raised bottom.



Second Type : A glass with conical raised bottom of height 1.5 cm.



Isha insisted to have the juice in first type of glass and her father decided to have the juice in second type of glass. Out of the two, Isha or her father Suresh, who got more quantity of juice to drink and by how much?

OR

A sphere of maximum volume is cut out from a solid hemisphere of radius 6 cm. Find the volume of the cut out sphere.

30. The weekly expenditure of 500 families is tabulated below :

Weekly Expenditure(Rs.)	Number of families
0-1000	150
1000-2000	200
2000-3000	75
3000-4000	60
4000-5000	15

Find the median expenditure.

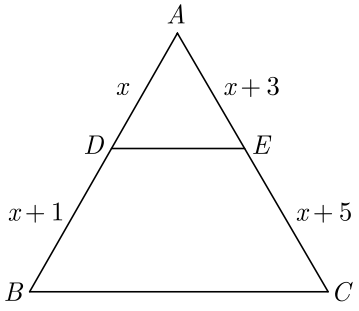
OR

Following frequency distribution shows the expenditure on milk of 30 households in a locality :

Daily expenditure on milk (Rs.)	0-30	30-60	60-90	90-120	120-150
Number of households	5	6	9	6	4

Find the mode for the above data.

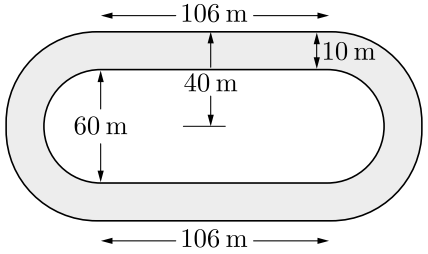
31. In $\Delta ABC, DE || BC$, find the value of x.



SECTION - D

Section D consists of 4 questions of 5 marks each.

32. Figure depicts a racing track whose left and right ends are semi-circular. The distance between the two inner parallel line segments is 60 m and they are each 106 m long. If the track is 10 m wide everywhere, find the area of the track.



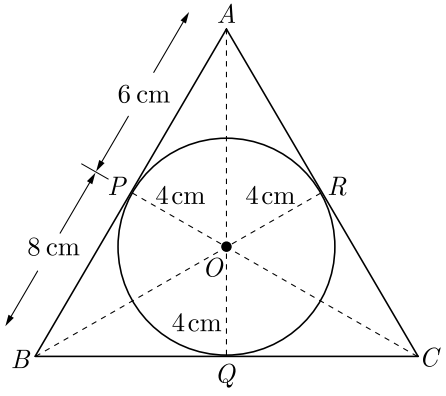
33. Find the value of p for which the quadratic equation $(p+1)x^2 - 6(p+1)x + 3(p+9) = 0,\ p \neq -1$ has equal roots. Hence find the roots of the equation.

OR

If the price of a book is reduced by ₹ 5, a person can by 4 more books for ₹ 600. Find the original price of the book.

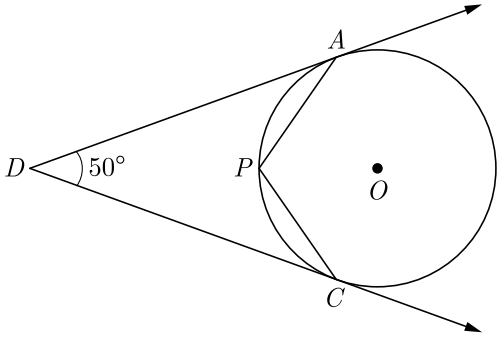
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34. In Figure the radius of incircle of ΔABC of area $84\,cm^2$ and the lengths of the segments AP and BP into which side AB is divided by the point of contact are 6 cm and 8 cm Find the lengths of the sides AC and BC.



OR

In the given figure, O is the centre of the circle. Determine $\angle APC$, if DA and DC are tangents and $\angle ADC = 50^\circ$.



35. If $A(5,2)$, $B(2,-2)$ and $C(-2,t)$ are the vertices of a right angled triangle with $\angle B = 90^o$, then find the value of t.

SECTION - E

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

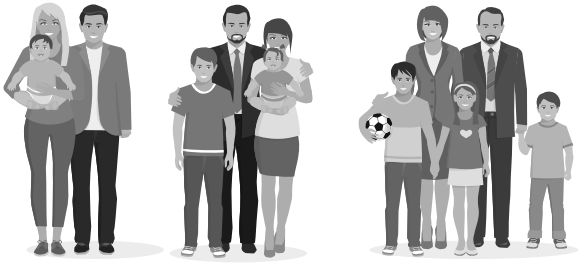
36. It takes 5 toothpicks to build the top trapezoid shown at below. You need 9 toothpicks to build 2 adjoined trapezoids and 13 toothpicks for 3 trapezoids.

(i) If 1000 toothpicks are available, how many trapezoids will be in the last complete row?
(ii) How many complete rows will there be?
(iii) How many toothpicks will you use to construct these rows?
(iv) Use the numbers in this problem to carefully describe the difference between a sequence and a series.

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37. Family Structures : For a recent year, 51% of the families in the United States had no children under the age of 18; 20% had one child; 19% had two children; 7% had three children; and 3% had four or more children.



If a family is selected at random, find the following probability.

(i) Find the probability that the family has two or three children.

(ii) Find the probability that the family has more than one child.

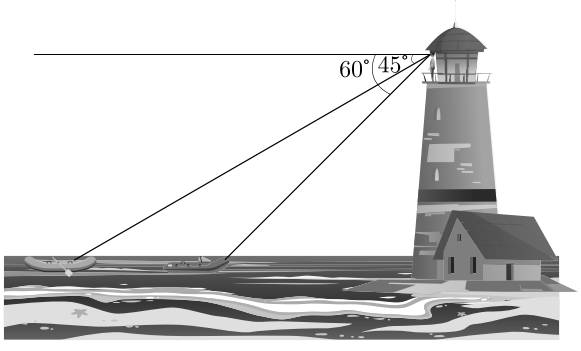
(iii) Find the probability that the family has less than three children.

(iv) Based on the answers to parts (i), (ii) and (iii) which is most likely to occur? Explain why.

38. From the observation deck of a seaside building 200 m high, Jignesh sees two fishing boats in the distance. The angle of depression to the nearer boat is 60° while for the boat farther away the angle is 45°.

(i) How far out to sea is the nearer boat?

(ii) How far apart are the two boats?



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