Sample Paper 25

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. While computing the mean of grouped data, we assume that the frequencies are

(a) Evenly distributed over all the classes

(b) Centred at the class marks of the classes

(c) Centred at the upper limits of the classes

(d) Centred at the lower limits of the classes

2. The top of two poles of height 20 m and 14 m are connected by a wire. If the wire makes an angle of 30° with the horizontal, then the length of the wire is

(a) 12 m (b) 10 m

(c) 8 m (d) 6 m

3. 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 the distance O_1O_2 is equal to

(a) 44 cm (b) 51 cm

(c) 40.5 cm (d) 45 cm

4. 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

5. If the sum of the zeroes of the polynomial $f(x) = 2x^3 - 3kx^2 + 4x - 5$ is 6, then the value of k is

(a) 2 (b) -2

(c) 4 (d) -4

6. If the coordinates of the point of intersection of less than ogive and more than ogive is (13.5, 20), then the value of median is

(a) 13.5 (b) 20

(c) 33.5 (d) 7.5

7. For what value of k, do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines ?

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$

(c) 2 (d) -2

8. The condition for one root of the quadratic equation $ax^2 + bx + c = 0$ to be twice the other, is

(a) $b^2 = 4ac$ (b) $2b^2 = 9ac$

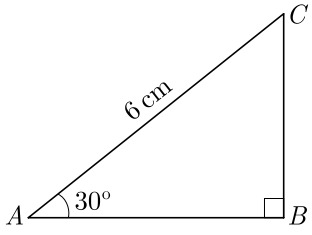
(c) $c^2 = 4a + b^2$ (d) $c^2 = 9a - b^2$

9. If in a lottery, there are 5 prizes and 20 blanks, then the probability of getting a prize is

(a) $\frac{2}{5}$ (b) $\frac{4}{5}$

(c) $\frac{1}{5}$ (d) 1

10. In the adjoining figure, the length of BC is



(a) $2\sqrt{3}$ cm (b) $3\sqrt{3}$ cm

(c) $4\sqrt{3}$ cm (d) 3 cm

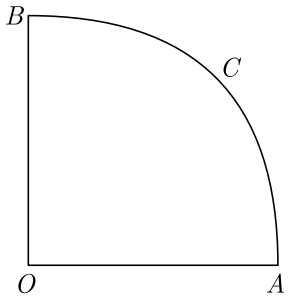
11. The probability that a two digit number selected at random will be a multiple of 3 and not a multiple of 5 is

(a) $\frac{2}{15}$ (b) $\frac{4}{15}$

(c) $\frac{1}{15}$ (d) $\frac{4}{90}$

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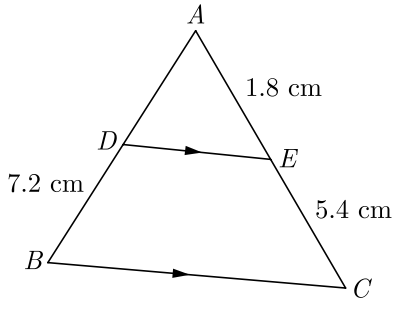
12. In the given figure, $OACB$ is a quadrant of a circle of radius 7 cm. The perimeter of the quadrant is



(a) 11 cm (b) 18 cm
(c) 25 cm (d) 36 cm

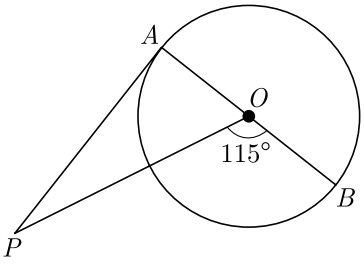
13. In an AP, if $a = 1$, $a_n = 20$ and $S_n = 399$, then n is equal to
(a) 19 (b) 21
(c) 38 (d) 42

14. In Figure, $DE \,||\, BC$. Find the length of side AD, given that $AE = 1.8\,\text{cm}$, $BD = 7.2\,\text{cm}$ and $CE = 5.4\,\text{cm}$.



(a) 2.4 cm (b) 2.2 cm
(c) 3.2 cm (d) 3.4 cm

15. In the given figure, PA is a tangent from an external point P to a circle with centre O. If $\angle POB = 115^\circ$, then perimeter of $\angle APO$ is



(a) 25° (b) 20°
(c) 30° (d) 65°

16. QP is a tangent to a circle with centre O at a point P on the circle. If $\Delta\, OPQ$ is isosceles, then $\angle\, OQR$ equals.

(a) 30° (b) 45°

(c) 60° (d) 90°

17. If $b\tan\theta = a$, the value of $\frac{a\sin\theta - b\cos\theta}{a\sin\theta + b\cos\theta}$ is

(a) $\frac{a-b}{a^2+b^2}$ (b) $\frac{a+b}{a^2+b^2}$

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

18. If the height and length of the shadow of a man are equal, then the angle of elevation of the sun is,

(a) 45° (b) 60°

(c) 90° (d) 120°

19. **Assertion :** Total surface area of the cylinder having radius of the base 14 cm and height 30 cm is $3872\,\text{cm}^2$
Reason : If r be the radius and h be the height of the cylinder, then total surface area $= (2\pi rh + 2\pi r^2)$.

(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 :** ABC and DEF are two similar triangles such that $BC = 4\,\text{cm}$, $EF = 5\,\text{cm}$ and area of $\Delta\, ABC = 64\,\text{cm}^2$, then area of $\Delta\, DEF = 100\,\text{cm}^2$.
Reason : The areas of two similar triangles are in the ratio of the squares of the corresponding altitudes.

(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).

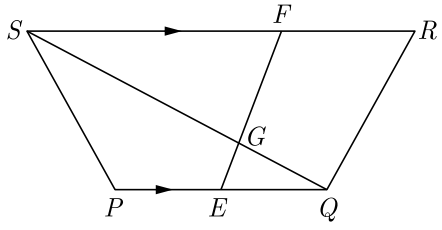
(c) Assertion (A) is true but reason (R) is false.

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

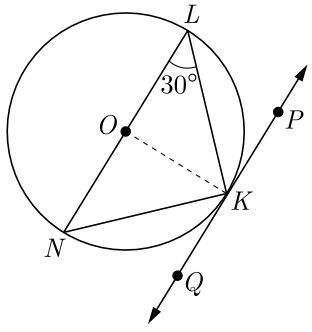
SECTION - B

Section B consists of 5 questions of 2 marks each.

21. In the figure, $PQRS$ is a trapezium in which $PQ \,||\, RS$. On PQ and RS, there are points E and F respectively such that EF intersects SQ at G. Prove that $EQ \times GS = GQ \times FS$.



22. In figure, O is the centre of the circle and LN is a diameter. If PQ is a tangent to the circle at K and $\angle KLN = 30^\circ$, find $\angle PKL$.



23. Evaluate : $\dfrac{3\tan^2 30^\circ + \tan^2 60^\circ + \operatorname{cosec} 30^\circ - \tan 45^\circ}{\cot^2 45^\circ}$

24. 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.

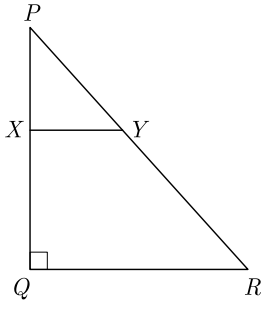
OR

In a family of two children find the probability of having at least one girl.

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

OR

In the given figure, PQR is a triangle right angled at Q and $XY \,||\, QR$. If $PQ = 6$ cm, $PY = 4$ cm and $PX : XQ = 1:2$. Calculate the length of PR and QR.



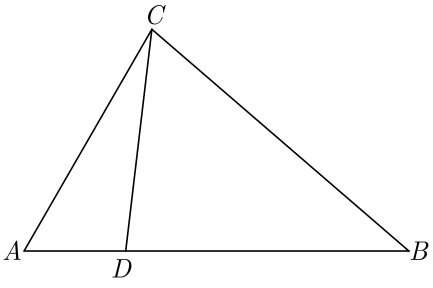
SECTION - C

Section C consists of 6 questions of 3 marks each.

26. Verify whether 2, 3 and $\frac{1}{2}$ are the zeroes of the polynomial $p(x) = 2x^3 - 11x^2 + 17x - 6$.

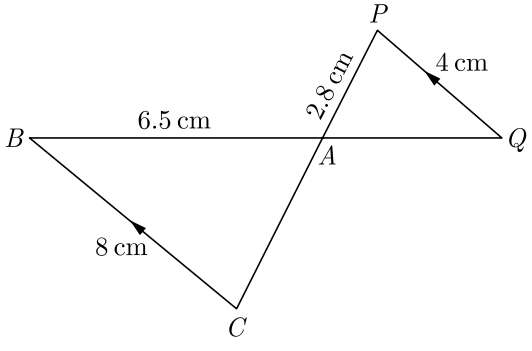
27. Solve for x and y : $\frac{x+1}{2}+\frac{y-1}{3}=9$; $\frac{x-1}{3}+\frac{y+1}{2}=8$.

28. In the given figure, if $\angle ACB = \angle CDA$, $AC = 6$ cm and $AD = 3$ cm, then find the length of AB.



OR

In the given figure, $BC || PQ$ and $BC = 8$ cm, $PQ = 4$ cm, $BA = 6.5$ cm $AP = 2.8$ cm Find CA and AQ.



29. Prove that $\frac{\tan^2 A}{\tan^2 A - 1}+\frac{\operatorname{cosec}^2 A}{\sec^2 A - \operatorname{cosec}^2 A}=\frac{1}{1-2\cos^2 A}$

30. A toy is in the form of a cone radius 3.5 cm mounted on a hemisphere of same radius. If the total height of the toy is 15.5 cm, find the total surface area of the toy. Use $\pi = \frac{22}{7}$

OR

A well of diameter 4 m dug 21 m deep. The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 3 m to form an embankment. Find the height of the embankment.

31. Given that $\sqrt{2}$ is irrational, prove that $(5+3\sqrt{2})$ is an irrational number.

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SECTION - D

Section D consists of 4 questions of 5 marks each.

32. Solve for x : $\frac{1}{x+1}+\frac{2}{x+2}=\frac{4}{x+4}$ $x \neq -1,-2,-4$

OR

Solve for x : $4x^2+4bx-(a^2-b^2)=0$

33. A right triangle ABC, right angled at A is circumscribing a circle. If $AB=6$ cm and $BC=10$ cm, find the radius r of the circle.

34. Daily wages of 110 workers, obtained in a survey, are tabulated below :

Daily Wages (in₹)	100-120	120-140	140-160	160-180	180-200	200- 220	220- 240
Number of Workers	10	15	20	22	18	12	13

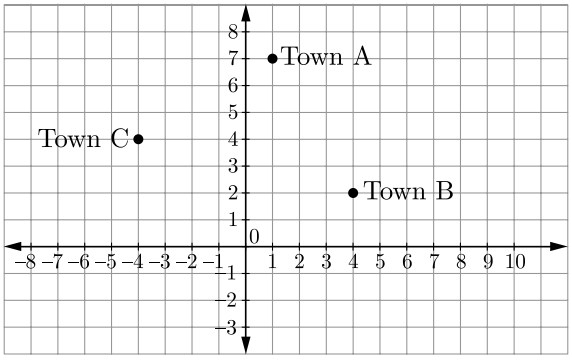
Compute the mean daily wages an modal daily wages of these workers.

OR

The mean of the following distribution is 18. Find the frequency of the class 19-21.

Class	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Frequency	3	6	9	13	f	5	4

35. Two friends Seema and Aditya work in the same office at Delhi. In the Christmas vacations, both decided to go to their hometown represented by Town A and Town B respectively in the figure given below. Town A and Town B are connected by trains from the same station C (in the given figure) in Delhi. Based on the given situation answer the following questions:



(i) Who will travel more distance, Seema or Aditya, to reach to their hometown?

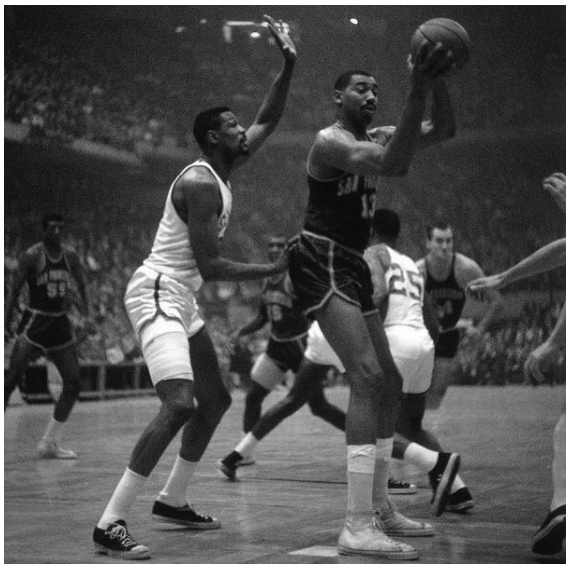
(ii) Seema and Aditya planned to meet at a location D situated at a point D represented by the mid-point of the line joining the points represented by Town A and Town B. Find the coordinates of the point represented by the point D.

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SECTION - E

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

36. Wilt Chamberlain : Wilton Norman "Wilt" Chamberlain was an American basketball player, and played in the NBA during the 1960s. At 7 feet 1 inch, he was the tallest and heaviest player in the league for most of his career, and he was one of the most famous people in the game for many years. He is the first and only basketball player to score 100 points in an NBA game.



In the 1961–1962 NBA basketball season, Wilt Chamberlain of the Philadelphia Warriors made 30 baskets. Some of the baskets were free throws (worth 1 point each) and some were field goals (worth 2 points each). The number of field goals was 10 more than the number of free throws.

(i) How many field goals did he make ?

(ii) How many free throws did he make?

(iii) What was the total number of points scored?

(iv) If Wilt Chamberlain played 5 games during this season, what was the average number of points per game?

37. Cubic Coating : Frozen specimens are stored in a cubic metal box that is x inches on each side. The box is surrounded by a 2 inch thick layer of foam insulation.

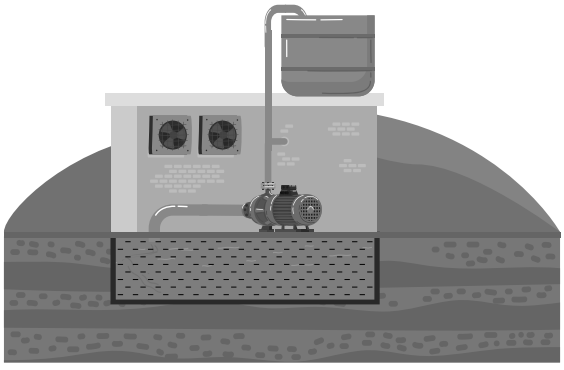
(i) Find a polynomial function $V(x)$ that gives the total volume in cubic inches for the box and insulation.

(ii) Find the total volume if x is 10 inches.

(iii) Use the remainder theorem to find the total volume when x is 10 inches.

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38. Underground water tank is popular in India. It is usually used for large water tank storage and can be built cheaply using cement-like materials. Underground water tanks are typically chosen by people who want to save space. The water in the underground tank is not affected by extreme weather conditions. The underground tanks maintain cool temperatures in both winter and summer. Electric pump is used to move water from the underground tank to overhead tank.



Ramesh has build recently his house and installed a underground tank and overhead tank. Dimensions of tanks are as follows :
Underground Tank : Base $2\,\text{m} \times 2\,\text{m}$ and Height 1.1 m.
Overhead tank : Radius 50 cm and Height 175 cm

(i) What is the capacity of the underground tank ?

(ii) What is the ratio of the capacity of the underground tank to the capacity of the overhead tank?

(iii) If curved part of overhead tank need to be painted to save it from corrosion, how much area need to be painted? If water is filled in the overhead tank at the rate of 11 litre per minute, the tank will be completely filled in how much time?

OR

(iv) If the amount of water in the underground tank, at an instant, is 2400 litres, find then the water level in the underground tank at that instant.

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