

**Class IX Session 2024-25**  
**Subject - Mathematics**  
**Sample Question Paper - 3**

**Time Allowed: 3 hours**

**Maximum Marks: 80**

**General Instructions:**

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment carrying 04 marks each.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take  $\pi = 22/7$  wherever required if not stated.

**Section A**

1.  $\pi$  is [1]
  - a) a rational number
  - b) an integer
  - c) an irrational number
  - d) a whole number
2. The linear equation  $3x - 5y = 15$  has [1]
  - a) no solution
  - b) infinitely many solutions
  - c) a unique solution
  - d) two solutions
3. Two points having same abscissa but different ordinates lie on [1]
  - a) y-axis
  - b) x-axis
  - c) a line parallel to y-axis
  - d) a line parallel to x-axis
4. To draw a histogram to represent the following frequency distribution : [1]

Class interval	5-10	10-15	15-25	25-45	45-75
Frequency	6	12	10	8	15

The adjusted frequency for the class 25-45 is

  - a) 6
  - b) 5
  - c) 2
  - d) 3
5. The graph of the linear equation  $2x + 3y = 6$  is a line which meets the x-axis at the point [1]
  - a) (0,3)
  - b) (3,0)

c) (2, 0)

d) (0, 2)

6. Euclid stated that all right angles are equal to each other in the form of [1]

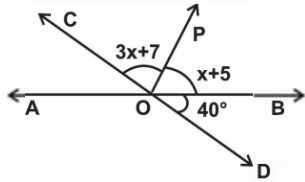
a) A postulate

b) A proof

c) An axiom

d) A definition

7. In the figure AB & CD are two straight lines intersecting at O, OP is a ray. What is the measure of  $\angle AOD$ . [1]



a)  $128^\circ$

b)  $40^\circ$

c)  $140^\circ$

d)  $100^\circ$

8. The diagonals AC and BD of a rectangle ABCD intersect each other at P. If  $\angle ABD = 50^\circ$ , then  $\angle DPC =$  [1]

a)  $70^\circ$

b)  $80^\circ$

c)  $90^\circ$

d)  $100^\circ$

9. Zero of the zero polynomial is - [1]

a) every real number

b) 1

c) not defined

d) 0

10. Express y in terms of x in the equation  $5x - 2y = 7$ . [1]

a)  $y = \frac{5x-7}{2}$

b)  $y = \frac{7-5x}{2}$

c)  $y = \frac{7x+5}{2}$

d)  $y = \frac{5x+7}{2}$

11. ABCD is a Rhombus such that  $\angle ACB = 40^\circ$ , then  $\angle ADB$  is [1]

a)  $100^\circ$

b)  $40^\circ$

c)  $60^\circ$

d)  $50^\circ$

12. Diagonals of a quadrilateral ABCD bisect each other. If  $\angle A = 45^\circ$ , then  $\angle B =$  [1]

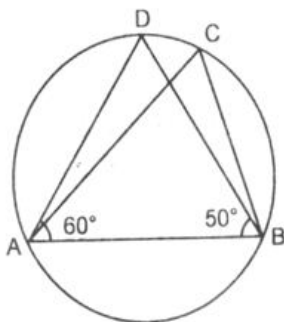
a)  $125^\circ$

b)  $115^\circ$

c)  $120^\circ$

d)  $135^\circ$

13. In the figure, if  $\angle DAB = 60^\circ$ ,  $\angle ABD = 50^\circ$ , then  $\angle ACB$  is equal to : [1]



a)  $80^\circ$

b)  $60^\circ$

c)  $50^\circ$

d)  $70^\circ$

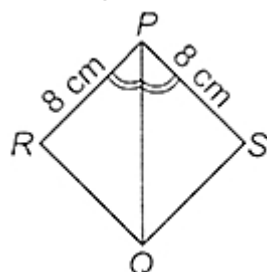
14. The simplest form of  $0.\overline{57}$  is [1]

- a)  $\frac{26}{45}$  b)  $\frac{57}{99}$   
c)  $\frac{57}{100}$  d)  $\frac{57}{90}$

15. Which of the following point does not lie on the line  $y = 2x + 3$ ? [1]

- a) (-5, -7) b) (-1, 1)  
c) (3, 9) d) (3, 7)

16. The congruence rule, by which the two triangles in the given figure are congruent is \_\_\_\_\_. [1]



- a) ASA b) SAS  
c) SSS d) RHS

17. In a histogram, which of the following is proportional to the frequency of the corresponding class? [1]

- a) Width of the rectangle b) Length of the rectangle  
c) Perimeter of the rectangle d) Area of the rectangle

18. The curved surface area of a cylinder and a cone is equal. If their base radius is same, then the ratio of the slant height of the cone to the height of the cylinder is [1]

- a) 1 : 1 b) 2 : 3  
c) 1 : 2 d) 2 : 1

19. **Assertion (A):** The sides of a triangle are 3 cm, 4 cm and 5 cm. Its area is  $6 \text{ cm}^2$ . [1]

**Reason (R):** If  $2s = (a + b + c)$ , where a, b, c are the sides of a triangle, then area =  $\sqrt{(s - a)(s - b)(s - c)}$ .

- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.  
c) A is true but R is false. d) A is false but R is true.

20. **Assertion (A):** The point (1, 1) is the solution of  $x + y = 2$ . [1]

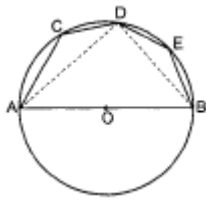
**Reason (R):** Every point which satisfy the linear equation is a solution of the equation.

- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.  
c) A is true but R is false. d) A is false but R is true.

### Section B

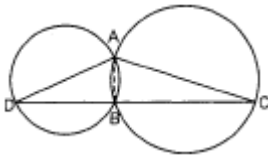
21. The base of an isosceles triangle measures 24 cm and its area is  $192 \text{ cm}^2$ . Find its perimeter. [2]

22. In given figure, AOB is a diameter of the circle and C, D, E are any three points on the semi-circle. Find the value of  $\angle ACD + \angle BED$ . [2]



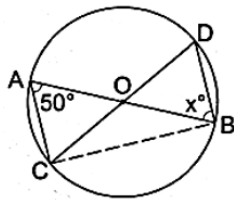
23. The outer diameter of a spherical shell is 10 cm and the inner diameter is 9 cm. Find the volume of the metal contained in the shell. [2]

24. In the given figure, two circles intersect at two points A and B. AD and AC are diameters to the two circles. Prove that B lies on the line segment DC. [2]



OR

If O is the centre of the circle, find the value of x in given figure:



25. Find whether the given equation have  $x = 2$ ,  $y = 1$  as a solution:  $x + y + 4 = 0$ . [2]

OR

Find whether  $(\sqrt{2}, 4\sqrt{2})$  is the solution of the equation  $x - 2y = 4$  or not?

### Section C

26. Give three rational numbers between  $\frac{1}{3}$  and  $\frac{1}{2}$ . [3]
27. Find the value of k, if  $x - 1$  is a factor of  $p(x)$  in case:  $p(x) = 2x^2 + kx + \sqrt{2}$  [3]
28. From a point in the interior of an equilateral triangle, perpendiculars are drawn on the three sides. The lengths of the perpendiculars are 14 cm, 10 cm and 6 cm. Find the area of the triangle. [3]

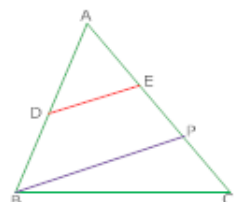
OR

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?

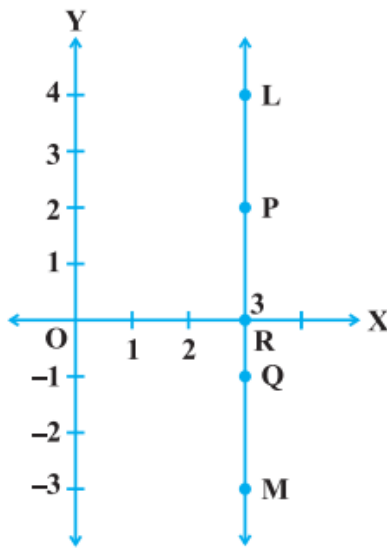
29. Find solutions of the form  $x = a$ ,  $y = 0$  and  $x = 0$ ,  $y = b$  for the following pairs of equations. Do they have any common such solution? [3]
- $3x + 2y = 6$  and  $5x + 2y = 10$
30. Show that the quadrilateral formed by joining the mid-points the sides of a rhombus, taken in order, form a rectangle. [3]

OR

In figure D is mid-points of AB. P is on AC such that  $PC = \frac{1}{2} AP$  and  $DE \parallel BP$ , then show that  $AE = \frac{1}{3} AC$ .



31. In Figure, LM is a line parallel to the y-axis at a distance of 3 units. [3]



- i. What are the coordinates of the points P, R and Q?
- ii. What is the difference between the abscissa of the points L and M?

#### Section D

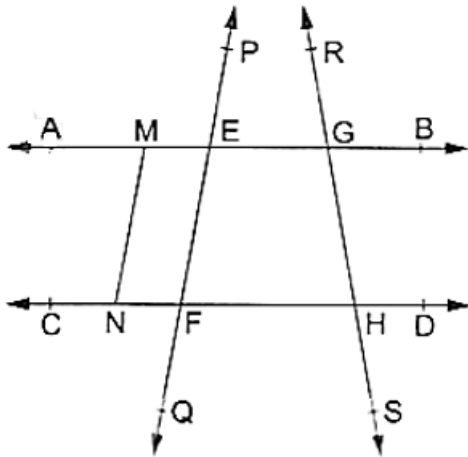
32. Find the values of a and b if  $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$ . [5]

OR

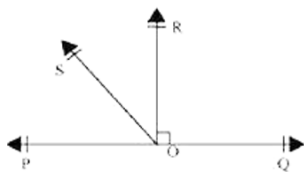
If  $p = \frac{3-\sqrt{5}}{3+\sqrt{5}}$  and  $q = \frac{3+\sqrt{5}}{3-\sqrt{5}}$ , find the value of  $p^2 + q^2$ .

33. In the adjoining figure, name: [5]

- i. Six points
- ii. Five line segments
- iii. Four rays
- iv. Four lines
- v. Four collinear points

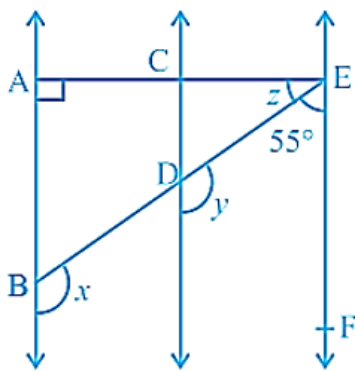


34. In the given figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that  $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$ . [5]



OR

Fig.,  $AB \parallel CD$  and  $CD \parallel EF$ . Also,  $EA \perp AB$ . If  $\angle BEF = 55^\circ$ , find the values of x, y and z.



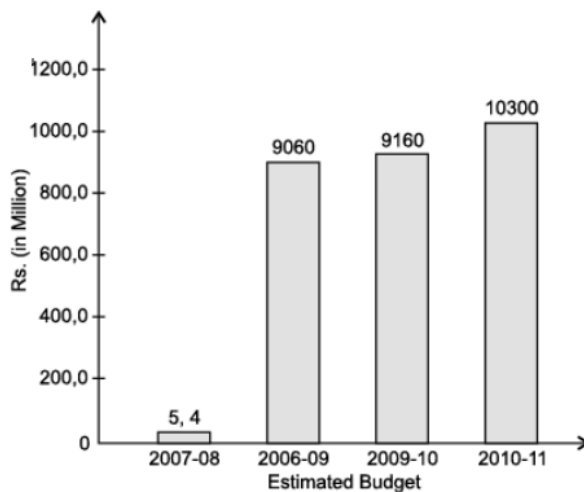
35. Find the values of  $a$  and  $b$  so that the polynomial  $(x^4 + ax^3 - 7x^2 - 8x + b)$  is exactly divisible by  $(x + 2)$  as well as  $(x + 3)$ . [5]

#### Section E

36. Read the following text carefully and answer the questions that follow: [4]

Ladli Scheme was launched by the Delhi Government in the year 2008. This scheme helps to make women strong and will empower a girl child. This scheme was started in 2008.

The expenses for the scheme are plotted in the following bar chart.



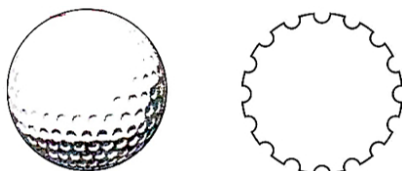
- What are the total expenses from 2009 to 2011? (1)
- What is the percentage of no of expenses in 2009-10 over the expenses in 2010-11? (1)
- What is the percentage of minimum expenses over the maximum expenses in the period 2007-2011? (2)

OR

What is the difference of expenses in 2010-11 and the expenses in 2006-09? (2)

37. Read the following text carefully and answer the questions that follow: [4]

A golf ball is spherical with about 300 - 500 dimples that help increase its velocity while in play. Golf balls are traditionally white but available in colours also. In the given figure, a golf ball has diameter 4.2 cm and the surface has 315 dimples (hemi-spherical) of radius 2 mm.



- i. Find the surface area of one such dimple. (1)
- ii. Find the volume of the material dug out to make one dimple. (1)
- iii. Find the total surface area exposed to the surroundings. (2)

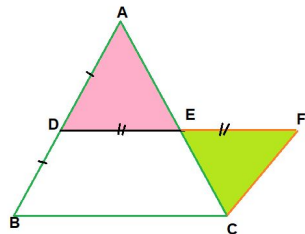
**OR**

Find the volume of the golf ball. (2)

38. **Read the following text carefully and answer the questions that follow:**

[4]

Haresh and Deep were trying to prove a theorem. For this they did the following



- i. Draw a triangle ABC
- ii. D and E are found as the mid points of AB and AC
- iii. DE was joined and DE was extended to F so  $DE = EF$
- iv. FC was joined.

**Questions:**

- i.  $\triangle ADE$  and  $\triangle EFC$  are congruent by which criteria? (1)
- ii. Show that  $CF \parallel AB$ . (1)
- iii. Show that  $CF = BD$ . (2)

**OR**

Show that  $DF = BC$  and  $DF \parallel BC$ . (2)

**Class IX Session 2024-25**  
**Subject - Mathematics**  
**Sample Question Paper - 2**

**Time Allowed: 3 hours**

**Maximum Marks: 80**

### General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment carrying 04 marks each.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take  $\pi = 22/7$  wherever required if not stated.

## Section A

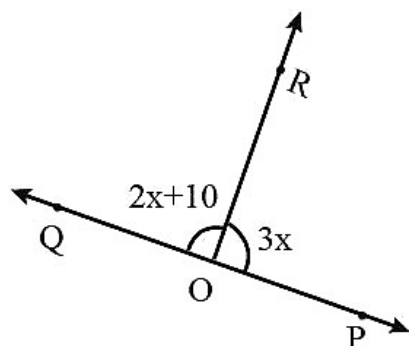
- $\sqrt{12} \times \sqrt{15} =$  [1]
  - 5
  - $5\sqrt{6}$
  - $6\sqrt{5}$
  - 6
- The graph of  $y = 6$  is a line [1]
  - Parallel to x-axis at a distance 6 units from the origin
  - Making an intercept 6 on the x- axis.
  - Making an intercept 6 on both the axes.
  - Parallel to y-axis at a distance 6 units from the origin
- Point  $(-10, 0)$  lies [1]
  - on the negative direction of the y-axis
  - on the negative direction of the X-axis
  - in the third quadrant
  - in the fourth quadrant
- In a histogram the class intervals or the groups are taken along [1]
  - X-axis
  - Y-axis
  - both of X-axis and Y-axis
  - in between X and Y axis
- If  $(2, 0)$  is a solution of the linear equation  $2x + 3y = k$ , then the value of  $k$  is [1]
  - 2
  - 4
  - 5
  - 6



6. The line segment with one end point at the centre and the other at any point on the circle is called \_\_\_\_\_. [1]

- a) diameter  
b) sector  
c) chord  
d) radius

7. Given  $\angle POR = 3x$  and  $\angle QOR = 2x + 10^\circ$ . If  $\angle POQ$  is a straight line, then the value of  $x$  is [1]



- a)  $36^\circ$   
b)  $30^\circ$   
c)  $34^\circ$   
d)  $42^\circ$

8. A diagonal of a Rectangle is inclined to one side of the rectangle at an angle of  $25^\circ$ . The Acute Angle between the diagonals is : [1]

- a)  $115^\circ$   
b)  $40^\circ$   
c)  $50^\circ$   
d)  $25^\circ$

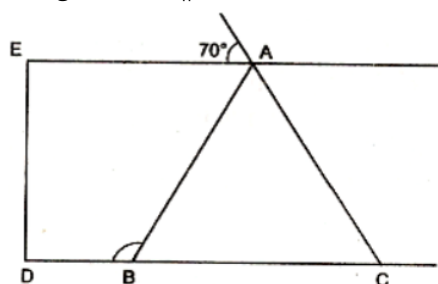
9. The remainder when  $x^{31} - 31$  is divided by  $x + 1$  is [1]

- a) -32  
b) 31  
c) 30  
d) 0

10. A linear equation in two variables is of the form  $ax + by + c = 0$ , where [1]

- a)  $a \neq 0$  and  $b = 0$   
b)  $a = 0$  and  $b = 0$   
c)  $a \neq 0$  and  $b \neq 0$   
d)  $a = 0$  and  $b \neq 0$

11. In figure, if  $AE \parallel DC$  and  $AB = AC$ , the value of  $\angle ABD$  is [1]



- a)  $110^\circ$   
b)  $120^\circ$   
c)  $130^\circ$   
d)  $70^\circ$

12. Two adjacent angles of a parallelogram are in the ratio 4 : 5. The angles are [1]

- a)  $90^\circ, 90^\circ$   
b)  $80^\circ, 100^\circ$   
c)  $60^\circ, 120^\circ$   
d)  $40^\circ, 140^\circ$

13. In the given figure, a circle is centred at O. The value of  $x$  is : [1]

b)  $55^\circ$ 

d)  $70^\circ$

14. If  $\sqrt{3} = 1.732$  and  $\sqrt{2} = 1.414$ , then the value of  $\frac{1}{\sqrt{3}-\sqrt{2}}$  is **[1]**

b)  $\frac{1}{3.146}$ d)  $\frac{1}{\sqrt{1.732} - \sqrt{1.414}}$ 

15. The line represented by the equation  $x + y = 16$  passes through  $(2, 14)$ . How many more lines pass through the point  $(2, 14)$  [1]

b) 2

d) 100

16. In a  $\triangle ABC$ , if  $\angle A - \angle B = 42^\circ$  and  $\angle B - \angle C = 21^\circ$  then  $\angle B = ?$  [1]

b)  $63^{\circ}$ 

d)  $32^0$

17.  $\sqrt{3}$  is a polynomial of degree. [1]

b) 2

d) 1

18. An icecream cone has hemispherical top. If the height of the cone is 9 cm and base radius is 2.5 cm, then the volume of icecream is **[1]**

b)  $96.67 \text{ cm}^3$

d)  $91\,76\text{ cm}^3$

19. **Assertion (A):** The height of the triangle is 18 cm and its area is  $72 \text{ cm}^2$ . Its base is 8 cm. [1]

**Reason (R):** Area of a triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$

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

d) A is false but R is true.

20. **Assertion (A):** The point  $(0, 3)$  lies on the graph of the linear equation  $3x + 4y = 12$ . [1]

**Reason (R):**  $(0, 3)$  satisfies the equation  $3x + 4y = 12$ .

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

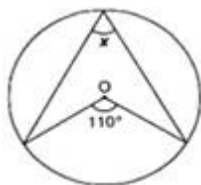
d) A is false but R is true.

## Section B

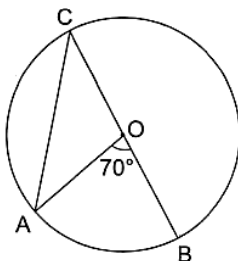
21. ABC and ADC are two right triangles with common hypotenuse AC. Prove that  $\angle CAD = \angle ABD$ . [2]

22. Find the area of equilateral triangle whose side is 12 cm using Heron's formula. [2]

23. Find an angle marked as  $x$  in given figure where  $O$  is the centre of the circle: [2]

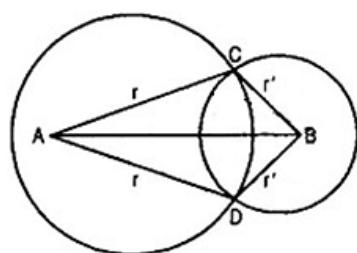


24. In the given figure,  $O$  is the centre of the circle and  $\angle AOB = 70^\circ$ . Calculate the values of (i)  $\angle OCA$ , (ii)  $\angle OAC$ . [2]



OR

Prove that the line of centres of two intersecting circles subtends equal angles at the two points of intersection.



25. The following values of  $x$  and  $y$  are thought to satisfy a linear equation : [2]

$x$	1	2
$y$	1	3

OR

Cost of pen is two half times the cost of a pencil. Express this situation as a linear equation in two variable.

### Section C

26. Locate  $\sqrt{3}$  on the number line. [3]  
 27. If  $x^2 + \frac{1}{x^2} = 34$ , find  $x^3 + \frac{1}{x^3} - 9$ . [3]  
 28. The cost of leveling the ground in the form of a triangle having the sides 51m, 37m and 20m at the rate of Rs.3 per  $m^2$  is Rs.918. State whether the statement is true or false and justify your answer. [3]

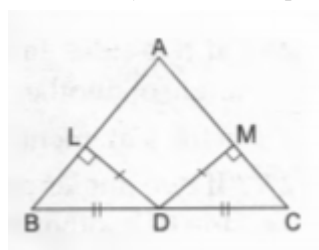
OR

The sides of a triangular plot are in the ratio of 3 : 5 : 7 and its perimeter is 300 m. Find its area.

29. A heap of wheat is in the form of a cone whose diameter is 10.5 m and height is 3 m. Find its volume. The heap is to be covered by canvas to protect it from rain. Find the area of the canvas required. [3]  
 30.  $\triangle ABC$  is an isosceles triangle in which  $AB = AC$ . Side  $BA$  is produced to  $D$  such that  $AD = AB$ . Show that  $\angle BCD$  is a right angle. [3]

OR

In  $\triangle ABC$ ,  $D$  is the midpoint of  $BC$ . if  $DL \perp AB$  and  $DM \perp AC$  such that  $DL = DM$ , prove that  $AB = AC$ .



31. Draw the graphs of  $y = x$  and  $y = -x$  in the same graph. Also find the co-ordinates of the point where the two lines intersect. [3]

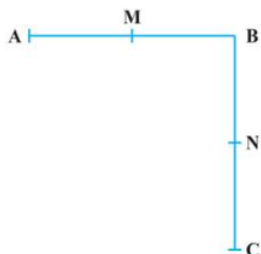
### Section D

32. If  $a = \frac{\sqrt{2}+1}{\sqrt{2}-1}$  and  $b = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ , then find the value of  $a^2 + b^2 - 4ab$ . [5]

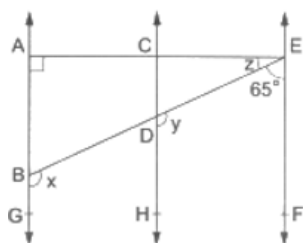
OR

If  $x$  is a positive real number and exponents are rational numbers, simplify  $\left(\frac{x^b}{x^c}\right)^{b+c-a} \cdot \left(\frac{x^c}{x^a}\right)^{c+a-b} \cdot \left(\frac{x^a}{x^b}\right)^{a+b-c}$ .

33. i.  $AB = BC$ ,  $M$  is the mid-point of  $AB$  and  $N$  is the mid-point of  $BC$ . Show that  $AM = NC$ . [5]  
ii.  $BM = BN$ ,  $M$  is the mid-point of  $AB$  and  $N$  is the mid-point of  $BC$ . Show that  $AB = BC$ .

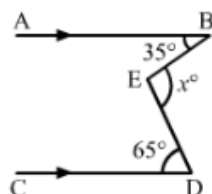


34. In the given figure,  $AB \parallel CD \parallel EF$ ,  $\angle DBG = x$ ,  $\angle EDH = y$ ,  $\angle AEB = z$ ,  $\angle EAB = 90^\circ$  and  $\angle BEF = 65^\circ$ . Find the values of  $x$ ,  $y$  and  $z$ . [5]



OR

In each of the figures given below,  $AB \parallel CD$ . Find the value of  $x^\circ$  in each case.



35. The following table shows the average daily earnings of 40 general stores in a market, during a certain week: [5]

Daily earning (in rupees)	700-750	750-800	800-850	850-900	900-950	950-1000
Number of stores	6	9	2	7	11	5

Draw a histogram to represent the above data.

### Section E

36. Read the following text carefully and answer the questions that follow: [4]

Vinod and Basant have an adventure tourism business in Rishikesh. They have a resort in Rishikesh but now they are planning to build some tent houses too.

The newly built tent house will have all the basic amenities and it will attract the young tourists coming for

adventure. Their conical tent is 9 m high and the radius of its base is 12 m.



- i. What is the cost of the canvas required to make it, if  $1 \text{ m}^2$  canvas costs ₹ 10? (1)
- ii. How many persons can be accommodated in the tent, if each person requires  $2 \text{ m}^2$  on the ground? (1)
- iii. How many persons can be accommodated in the tent, if each person requires  $15 \text{ m}^3$  of space to breathe in? (2)

**OR**

If each person requires  $20 \text{ m}^3$  of space to breathe in and 100 person can be accommodated then what should be height of tent? (2)

37. **Read the following text carefully and answer the questions that follow:**

[4]

Reeta was studying in the class 9th C of St. Surya Public school, Mehrauli, New Delhi-110030

Once Ranjeet and his daughter Reeta were returning after attending teachers' parent meeting at Reeta's school.

As the home of Ranjeet was close to the school so they were coming by walking.

Reeta asked her father, "Daddy how old are you?"

Ranjeet said, "Sum of ages of both of us is 55 years, After 10 years my age will be double of you."



- i. What is the second equation formed? (1)
- ii. What is the present age of Reeta in years? (1)
- iii. What is the present age of Ranjeet in years? (2)

**OR**

If the ratio of age of Reeta and her mother is 3 : 7 then what is the age of Reeta's mother in years? (2)

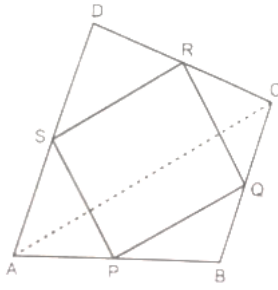
38. **Read the following text carefully and answer the questions that follow:**

[4]

Modern curricula include several problem-solving strategies. Teachers model the process, and students work

independently to copy it. Sheela Maths teacher of class 9<sup>th</sup> wants to explain the properties of parallelograms in a creative way, so she gave students colored paper in the shape of a quadrilateral and then ask the students to make

a parallelogram from it by using paper folding.



- i. How can a parallelogram be formed by using paper folding? (1)
- ii. If  $\angle RSP = 30^\circ$ , then find  $\angle RQP$ . (1)
- iii. If  $\angle RSP = 50^\circ$ , then find  $\angle SPQ$ ? (2)

**OR**

If  $SP = 3$  cm, Find the  $RQ$ . (2)

**Class IX Session 2024-25**  
**Subject - Mathematics**  
**Sample Question Paper - 1**

**Time Allowed: 3 hours**

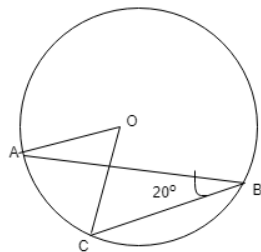
**Maximum Marks: 80**

### General Instructions:

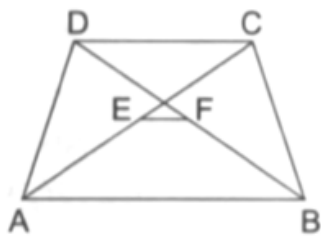
1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment carrying 04 marks each.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take  $\pi = 22/7$  wherever required if not stated.

## Section A

1. The point which lies on x-axis at a distance of 3 units in the positive direction of x-axis is [1]  
a) (0, -3) b) (0, 3)  
c) (3, 0) d) (-3, 0)
2. The length of the sides of a triangle are 5 cm, 7 cm and 8 cm. Area of the triangle is : [1]  
a)  $100\sqrt{3}$  cm<sup>2</sup> b)  $10\sqrt{3}$  cm<sup>2</sup>  
c) 300 cm<sup>2</sup> d)  $50\sqrt{3}$  cm<sup>2</sup>
3. In the figure, O is the centre of the circle. If  $\angle ABC = 20^\circ$ , then  $\angle AOC$  is equal to : [1]



- a)  $60^\circ$   
b)  $10^\circ$   
c)  $40^\circ$   
d)  $20^\circ$
4. In a trapezium ABCD, E and F be the midpoints of the diagonals AC and BD respectively. Then, EF = ? [1]

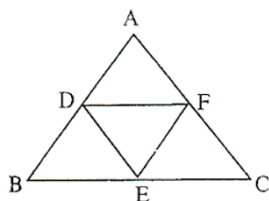


- a)  $\frac{1}{2}AB$   
c)  $\frac{1}{2}(AB - CD)$
- b)  $\frac{1}{2}(AB + CD)$   
d)  $\frac{1}{2}CD$

5. The value of  $x^{p-q} x^{q-r} x^{r-p}$  is equal to

- a)  $x^{pqr}$   
c)  $x$
- b) 0  
d) 1

6. D, E and F are the mid points of sides AB, BC and CA of  $\triangle ABC$ . If perimeter of  $\triangle ABC$  is 16 cm, then perimeter of  $\triangle DEF$ .



- a) 32 cm                      b) 8 cm  
c) 28 cm                     d) 4 cm

7.  $x = 2, y = -1$  is a solution of the linear equation

- a)  $2x + y = 0$   
c)  $x + 2y = 4$
- b)  $x + 2y = 0$   
d)  $2x + y = 5$

8. If  $x - 3$  is a factor of  $x^2 - ax - 15$ , then  $a =$

- a) 5                                      b) -2  
c) -5                                     d) 3

9. The value of  $15\sqrt{15} \div 3\sqrt{5}$  is

- a)  $5\sqrt{3}$   
c) 3
- b)  $3\sqrt{5}$   
d) 5

10. ABCD is a parallelogram. If  $\overline{AD}$  is produced to E such that ED bisects BC at O. Then which of the following is correct?

- a)  $OC = BE$   
c)  $AB = OE$
- b)  $OE = OC$   
d)  $AB = BE$

11. An irrational number between  $\frac{1}{7}$  and  $\frac{2}{7}$  is

- a)  $\sqrt{\frac{1}{7} \times \frac{2}{7}}$       b)  $\frac{1}{2} \left( \frac{1}{7} - \frac{2}{7} \right)$   
c)  $\left( \frac{1}{7} \times \frac{2}{7} \right)$       d)  $\frac{1}{2} \left( \frac{1}{7} + \frac{2}{7} \right)$

12. How many linear equations in 'x' and 'y' can be satisfied by  $x = 1, y = 2$ ?

- a) Infinitely many                      b) Two

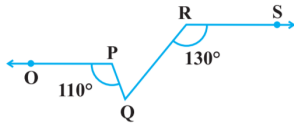


c) Only one

d) Three

13. In a figure, if  $OP \parallel RS$ ,  $\angle OPQ = 110^\circ$  and  $\angle QRS = 130^\circ$ , then  $\angle PQR$  is equal to

[1]



a)  $40^\circ$

b)  $50^\circ$

c)  $70^\circ$

d)  $60^\circ$

14. After rationalising the denominator of  $\frac{7}{3\sqrt{3}-2\sqrt{2}}$ , we get the denominator as

[1]

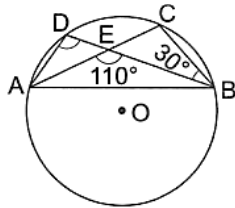
a) 5

b) 35

c) 19

d) 13

15. In the given figure, O is the centre of a circle and chords AC and BD intersect at E. If  $\angle AEB = 110^\circ$  and  $\angle CBE = 30^\circ$ , then  $\angle ADB = ?$



a)  $80^\circ$

b)  $60^\circ$

c)  $90^\circ$

d)  $70^\circ$

16. x co-ordinate is known as

[1]

a) Origin

b) Points

c) Abscissa

d) Ordinate

17. If  $(-2, 5)$  is a solution of  $2x + my = 11$ , then the value of 'm' is

[1]

a) -2

b) 2

c) 3

d) -3

18. The value of  $\frac{(a^2-b^2)^3 + (b^2-c^2)^3 + (c^2-a^2)^3}{(a-b)^3 + (b-c)^3 + (c-a)^3}$  is

[1]

a)  $3(a-b)(b-c)(c-a)$

b)  $(a+b)(b+c)(c+a)$

c)  $3(a+b)(b+c)(c+a)(a-b)(b-c)(c-a)$

d)  $2(a-b)(b-c)(c-a)$

19. **Assertion (A):** If the diagonals of a parallelogram ABCD are equal, then  $\angle ABC = 90^\circ$

[1]

**Reason (R):** If the diagonals of a parallelogram are equal, it becomes a rectangle.

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

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

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):**  $2 + \sqrt{6}$  is an irrational number.

[1]

**Reason (R):** Sum of a rational number and an irrational number is always an irrational number.

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

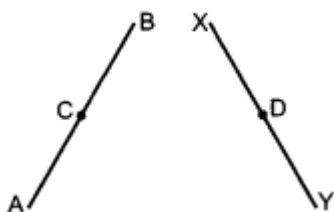
b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

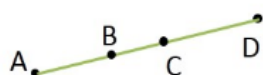
d) A is false but R is true.

### Section B

21. In fig.  $AC = XD$ , C is the mid-point of AB and D is the mid-point of XY. Using a Euclid's axiom, show that  $AB = XY$ . [2]



22. In fig., if  $AC = BD$ , then prove that  $AB = CD$  [2]



23. Name the quadrants in which the following points lie : [2]

- (i)  $P(4, 4)$
- (ii)  $Q(-4, 4)$
- (iii)  $R(-4, -4)$
- (iv)  $S(4, -4)$

24. If  $x = 3 + 2\sqrt{2}$ , find the value of  $\left(x^2 + \frac{1}{x^2}\right)$ . [2]

OR

Prove that:  $\frac{1}{3+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+1} = 1$ .

25. The radii of two cones are in the ratio 2 : 1 and their volumes are equal. What is the ratio of their heights? [2]

OR

A hollow spherical shell is made of a metal of density  $4.5 \text{ g per cm}^3$ . If its internal and external radii are 8 cm and 9 cm respectively, find the weight of the shell.

### Section C

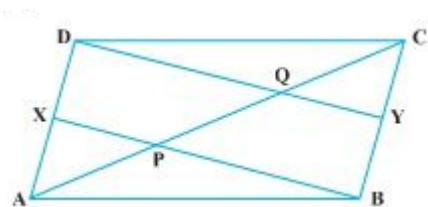
26. Locate  $\sqrt{10}$  on the number line. [3]

27. A random survey of the number of children of various age groups playing in a park was found as follows : [3]

Age (in years)	Number of children
1-2	5
2-3	3
3-5	6
5-7	12
7-10	9
10-15	10
15-17	4

Draw a histogram to represent the data above.

28. In Fig. X and Y are respectively the mid-points of the opposite sides AD and BC of a parallelogram ABCD. Also, BX and DY intersect AC at P and Q, respectively. Show that  $AP = PQ = QC$ . [3]



29. Find the solution of the linear equation  $x + 2y = 8$  which represents a point on [3]

- The x-axis
- The y-axis

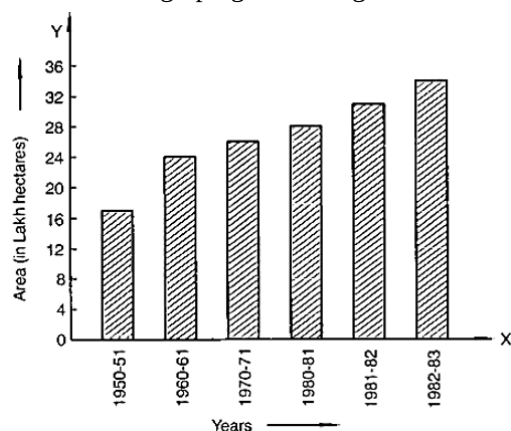
30. The marks scored by 750 students in an examination are given in the form of a frequency distribution table. [3]

Marks:	600-640	640-680	680-720	720-760	760-800	800-840	840-880
No. of Students:	16	45	156	284	172	59	18

Represent this data in the form of a histogram and construct a frequency polygon.

OR

Read the bar graph given in Figure and answer the following questions:



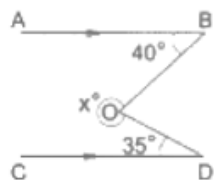
- What information is given by the bar graph?
- In which years the areas under the sugarcane crop were the maximum and the minimum?
- State whether true or false:

The area under the sugarcane crop in the year 1982-83 is three times that of the year 1950-51.

31. If both  $(x - 2)$  and  $(x - \frac{1}{2})$  are factors of  $px^2 + 5x + r$ , Show that  $p = r$ . [3]

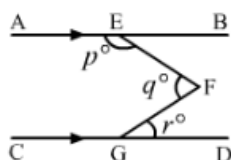
#### Section D

32. In the given figure,  $AB \parallel CD$ ,  $\angle ABO = 40^\circ$ ,  $\angle CDO = 35^\circ$ . Find the value of the reflex  $\angle BOD$  and hence the value of  $x$ . [5]



OR

In the given figure,  $AB \parallel CD$ . Prove that  $p + q - r = 180$ .



33. What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6 m? [5]

Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. (Use  $\pi = 3.14$ )

34. The length of the sides of a triangle are in the ratio 3 : 4 : 5 and its perimeter is 144 cm. Find the area of the triangle and the height corresponding to the longest side [5]

OR

Two sides of a triangular field are 85 m and 154 m in length and its perimeter is 324 m. Find the area of the field.

35. Using factor theorem, factorize the polynomial:  $x^3 - 6x^2 + 3x + 10$  [5]

#### Section E

36. Read the following text carefully and answer the questions that follow: [4]

Peter, Kevin James, Reeta and Veena were students of Class 9th B at Govt Sr Sec School, Sector 5, Gurgaon.

Once the teacher told **Peter to think a number x and to Kevin to think another number y** so that the difference of the numbers is 10 ( $x > y$ ).

Now the teacher asked James to add double of Peter's number and that three times of Kevin's number, the total was found 120.

Reeta just entered in the class, she did not know any number.

The teacher said Reeta to form the 1st equation with two variables x and y.

Now Veena just entered the class so the teacher told her to form 2nd equation with two variables x and y.

Now teacher Told Reeta to find the values of x and y. Peter and kelvin were told to verify the numbers x and y.



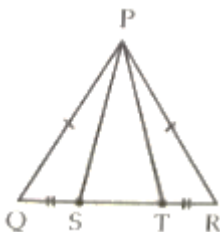
- What are the equation formed by Reeta and Veena? (1)
- What was the equation formed by Veena? (1)
- Which number did Peter think? (2)

OR

Which number did Kelvin think? (2)

37. Read the following text carefully and answer the questions that follow: [4]

A children's park is in the shape of isosceles triangle said PQR with  $PQ = PR$ , S and T are points on QR such that  $QT = RS$ .



- Which rule is applied to prove that congruency of  $\triangle PQS$  and  $\triangle PRT$ . (1)
- Name the type of  $\triangle PST$ . (1)
- If  $PQ = 6$  cm and  $QR = 7$  cm, then find perimeter of  $\triangle PQR$ . (2)

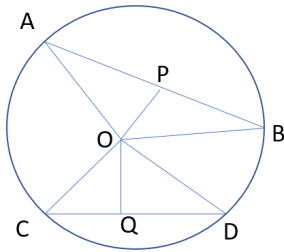
OR

If  $\angle QPR = 80^\circ$  find  $\angle PQR$ ? (2)

38. **Read the following text carefully and answer the questions that follow:**

[4]

Rohan draws a circle of radius 10 cm with the help of a compass and scale. He also draws two chords, AB and CD in such a way that the perpendicular distance from the center to AB and CD are 6 cm and 8 cm respectively. Now, he has some doubts that are given below.



- i. Show that the perpendicular drawn from the Centre of a circle to a chord bisects the chord. (1)
- ii. What is the length of CD? (1)
- iii. What is the length of AB? (2)

**OR**

How many circles can be drawn from given three noncollinear points? (2)