

Half Yearly Maths **MIND CURVE** Practice Paper Series 2023-24

By Deepika Bhati Teaching Mathematics Passionately since 2009

S no	Syllabus Covered	Chapters(In Half Yearly)	Marking Scheme
1.	Unit 1 Number System	Real Numbers	7
2.	Unit 2 Algebra	Polynomials Linear Equation In 2 Var. Quadratic Equation Arithmetic Expression	21
3.	Unit 3 Geometry	Similar Triangles	12
4.	Unit 4 Coordinate Geometry	Coordinate Geometry	10
5.	Unit 5 Trigonometry	Intro To Trigonometry	12
6.	Unit 6 Mensuration	Area Related To Circles	8
7.	Unit 7 Stats & Probability	Statistics Probability	10

Note: Students/Teachers can refer to this Sample Paper for practice purpose. However, students may find or experience different exam pattern as syllabus or marking scheme may vary school to school.

MM:80

GENERAL INSTRUCTIONS

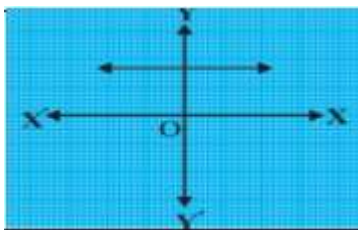
TIME:3 Hrs

READ CAREFULLY ALL INSTRUCTIONS

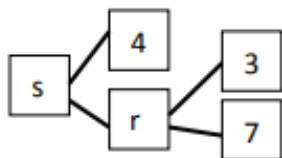
1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub parts of the values of 1, 1 and 2 marks each respectively.
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 2marks questions of Section E
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.
9. This paper consists of 38 questions.
 - a. Write your answers neatly and legibly.
 - b. Ensure you have not left any question unanswered

Section A (1 Marker)

1. What is the HCF of the least prime number and the least composite number
 (a) 1 (b) 2 (c) 3 (d) 4
2. The graphs of $y = p(x)$ are given in Fig, for some polynomials $p(x)$. Find the number of zeroes of $p(x)$.



- (a) 0 (b) 1 (c) 2 (d) 3
3. If two positive integers p and q are written as $p = x^5 y^2$, $q = x^3 y^3$, where x, y are prime no's then HCF (p, q) is :
 (a) xy (b) $x^2 y^2$ (c) $x^3 y^2$ (d) $x^5 y^3$
4. The degree of zero polynomial is
 (a) 0 (b) 1 (c) 2 (d) not defined
5. The values of r and s in the given figure is



- (a) $r = 10, s = 14$ (b) $r = 21, s = 84$
 (c) $r = 21, s = 25$ (d) $r = 10, s = 40$
6. AOBC is a rectangle whose three vertices are $A(0, 3)$, $O(0, 0)$ and $B(3, 0)$. The length of its diagonal is:
 (a) 5 (b) 3 (c) $\sqrt{34}$ (d) 4
7. The value of k for which $kx + 2y = 5$ and $3x + y = 1$ have unique solution, is:
 (a) $k = -1$ (b) $k \neq 6$ (c) $k = 6$ (d) $k = 2$
8. The perimeter of a triangle with vertices $(0, 4)$, $(0, 0)$ and $(3, 0)$ is:
 (a) 5 (b) 12 (c) 11 (d) 4
9. The median of set of 9 distinct observations is 20.5. If each of the largest 4 observations of the set is increased by 2, then the median of the new set
 (a) is increased by 2 (b) is decreased by 2
 (c) is two times of the original number (d) Remains the same as that of the original set
10. Hypotenuse of a right triangle is 25 cm and out of the remaining two sides, one is longer than the other by 5 cm. The lengths of the other two sides are-
 (a) 15 cm and 10 cm (b) 15 cm and 20 cm
 (c) 12 cm and 23 cm (d) 10 cm and 15 cm
11. In $\triangle ABC$, $AB = 24$ cm, $BC = 10$ cm and $AC = 26$ cm, such that the $\triangle ABC$ is-

- (a) a right triangle
(c) obtuse angled triangle

- (b) an acute angled triangle
(d) a right isosceles triangle

12. If $\sin \theta = x$ and $\sec \theta = y$ then the value of $\cot \theta$ is

- (a) xy (b) x/y (c) y/x (d) $1/xy$

13. The graph of an equation $y = -3$ is a line which will be:

- (a) parallel to x-axis (b) parallel to y-axis
(c) passing through origin (d) on x-axis

14. If $\sec \theta - \tan \theta = 1/3$, then find the value of $(\sec \theta + \tan \theta)$.

- (a) 4 (b) 6 (c) 3 (d) 2

15. The polynomial equation $x(x+1)+8=(x+2)(x-2)$ is

- (a) linear equation (b) quadratic equation
(c) cubic equation (d) none of these.

16. If $\sin A = \frac{1}{2}$, then find the Value of $\cos A$

- (a) $\frac{\sqrt{5}}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{\sqrt{3}}{3}$ (d) $\frac{\sqrt{3}}{5}$

17. Which of the following is not a quadratic equation

- (a) $x^2 + 3x - 5 = 0$ (b) $x^2 + x^3 + 2 = 0$
(c) $3 + x + x^2 = 0$ (d) $x^2 - 9 = 0$

18. The diameter of a wheel is 1.26 m. The distance travelled in 500 revolutions is

- (a) 1890 m (b) 1790 m (c) 1980 m (d) 1880 m

19. **ASSERTION:** 5 is an example of a rational number.

REASON: The square root of all positive integers is irrational numbers.

- (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 (A):** The midpoint of the line segment joining the points A $(-3, 1)$ and B $(1, -1)$ is $(-1, 0)$.

Reason (R): as formula for the midpoint is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$.

- (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 (2 Marker)

21. Find two consecutive positive integers, the sum of whose squares is 365.

Or

Solve : $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ and Verify the relationship between zeros and coefficients.

22. If $\cot \theta = 7/8$ then evaluate $\frac{(1-\sin \theta)(1+\sin \theta)}{(1-\cos \theta)(1+\cos \theta)}$

23. R and S are points on the sides DE and EF respectively of a ΔDEF Such that $ER = 5$ cm, $RD = 2.5$ cm, $SE = 1.5$ cm and $FS = 3.5$ cm. Find whether $RS \parallel DF$ or not.

24. Neha and Nisha are playing Balut game with two dice. Each has her own dice. Two different dice are thrown together. Find the probability of the number obtained:

(i) even sum (ii) even product

25. Find the circumference of a circle whose area is 301.84cm^2 .

Section C (3 Marker)

26. Students of a class are made to stand in rows. If one student is extra in a row, there would be 2 rows less, if one student is less in a row there would be 3 rows more. Find the number of the students in the

27. Prove that $\frac{\tan \theta}{1-\cot \theta} + \frac{\cot \theta}{1-\tan \theta} = 1 + \sec \theta \operatorname{cosec} \theta$

28. If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of the polynomial $2x^2 - 5x - 3$, then find the values of p and q.

29. Check whether 3^n never ends with the digit 0 for any natural number n.

30. Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$

31. The area of a rectangle reduces by 160 m^2 if its length is increased by 5 m and breadth is reduced by 4 m. However, if length is decreased by 10 m and breadth is increased by 2 m, then its area is decreased by 100 m^2 . Find the dimensions of the rectangle.

OR

A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 20 days, she has to pay ₹ 3000 as hostel charges whereas a student B, who takes food for 25 days, pays ₹ 3500 as hostel charges. Find Sheena's hostel charges if she takes food for 12 days.

Section D (5 Marker)

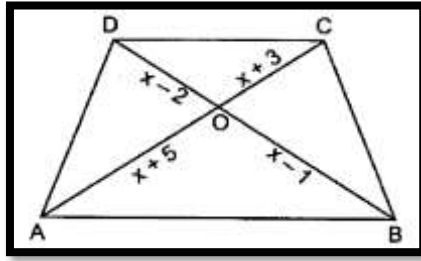
32. If the quadratic equation $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$ has equal roots, prove that $c^2 = a^2(1 + m^2)$.

33. A round table cover has six equal designs as shown in Fig. If the radius of the cover is 28 cm, find the cost of making the designs at the rate of Rs 0.35 per cm^2 . (Use $\sqrt{3} = 1.7$)



34. Diagonals AC and BD of a trapezium ABCD with AB parallel to DC intersect each other at the point O. Using a similarity criterion for two triangles, show that $\frac{OA}{OB} = \frac{OC}{OD}$.

Hence find the value of x in the following figure if ABCD is a trapezium with AB parallel to DC.



35. The percentage of marks obtained by 100 students in an examination are given below:

Class interval	30 -35	35 -40	40 -45	45 - 50	50-55	55- 60	60 -65
Frequency	14	16	18	23	18	8	3

Determine the median percentage of marks.

OR

Find the missing frequencies if the median is 32.5 and sum of frequencies is 40

X	10	10-20	20-30	30-40	40-50	50-60	60-70
F	x	5	9	12	y	3	2

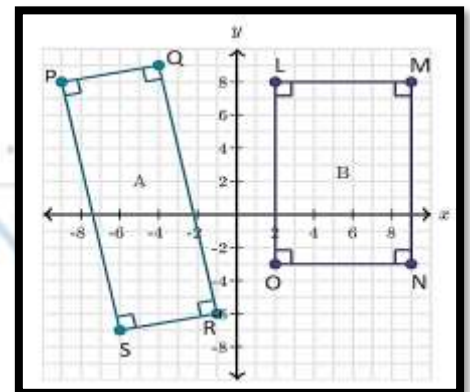
Section E (4 Marker)

36. The best use of Geometry in daily life is the construction of buildings, dams, rivers, roads, etc. The applications of coordinate geometry in daily life can also be found in interior design. Setting new items in an open space is done perfectly using the concepts of coordinate geometry. Sara is considering two different layouts for her new garden. The following diagram shows both layouts on a coordinate grid.

- Find the co-ordinates of the points O and M.
- What is the length of diagonal OM?
- Find the ratio in which x-axis divides the line segment joining the points P and S.

OR

Find a relation between x and y such that the point (x, y) is equidistant from the points L and M.



37. Rainbow is an arch of colours that is visible in the sky, caused by the refraction and dispersion of the sun's light after rain or other water droplets in the atmosphere. The colours of the rainbow are generally said to be red, orange, yellow, green, blue, indigo and violet. Each colour of rainbow makes a parabola. We know that for any quadratic polynomial $ax^2 + bx + c$, $a \neq 0$, the graph of the corresponding equation $y = ax^2 + bx + c$ has one of the two shapes either open upwards like U or open downwards like $\cap$ depending on whether $a > 0$ or $a < 0$. These curves are called parabolas. Based on the given information, answer the following :

- (i) A rainbow is represented by the quadratic polynomial $x^2 + (a + 1)x + b$ whose zeroes are 2 and -3. Find a and b
- (ii) The polynomial $x^2 - 2x - (7p + 3)$ represents a rainbow. If -4 is zero of it, then find the value of p .
- (iii) If u and v are zeros of polynomial represent a rainbow $P(x) = x^2 + 4x + 5$ then form a polynomial with zeros $3u^2$ and $3v^2$.



Or

If u and v are zeros of polynomial represent a rainbow $P(x) = x^2 + 4x + 5$ then find k if sum of root is 3 times product of root

38. It is a clock that uses a pendulum, a swinging weight, as its timekeeping element. From its invention in 1656 by Christiaan Huygens, the pendulum clock was the world's most precise timekeeper, accounting for its widespread use. Their greater accuracy allowed for the faster pace of life which was necessary for the Industrial Revolution. The home pendulum clock was replaced by less-expensive, synchronous, electric clocks in the 1930s and 40s. Pendulum clocks are now kept mostly for their decorative and antique value.

Dhriti bought a pendulum clock for her living room. the clock contains a small pendulum of length 45 cm. the minute hand and hour hand of the clock are 14 cm and 6 cm long respectively.

Based on the given information , answer the following :

- (i) What is the area swept by the minute hand in 14 minutes?
- (ii) What is the angle described by hour hand in 10 minutes?
- (iii) What is the distance covered by the tip of hour hand in 3.5 hours

Or

Find the ratio of length of arc by the tip of minute hand in 15 minutes to 30 minutes.



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