DAV PUBLIC SCHOOLS, ODISHA
PERIODIC ASSESSMENT-1 (2023-24)

> ➢ Check that this question paper contains **four** printed pages.
> ➢ Check that this question paper contains **19** questions.

CLASS- IX
SUBJECT: MATHEMATICS

Time allotted: 1 hour 30 minutes   **M.M:40**

GENERAL INSTRUCTIONS:
1. *This Question Paper has 5 Sections A-E.*
2. *Section A has 10 MCQs carrying 1 mark each.*
3. *Section B has 02 questions carrying 02 marks each.*
4. *Section C has 04 questions carrying 03 marks each.*
5. *Section D has 02 questions carrying 05 marks each.*
6. *Section E has 01 case based integrated units of assessment (04 marks) with subparts of the values of 1, 1 and 2 marks each respectively.*
7. *All Questions are compulsory. However, an internal choice in 01 Question of 5 marks, 01 Question of 3 marks and 01 Question of 2 marks has been provided. An internal choice has been provided in the 2 marks question of Section E.*
8. *Draw neat figures wherever required.*

SECTION-A

1. Degree of the zero polynomial is

    (a) 0   (b) 1   (c) any real number   (d) not defined

2. Euclid divided his famous treatise "The Elements" into

    (a) 13 chapters   (b) 12 chapters   (c) 11 chapters   (d) 9 chapters

3. If the coordinates of a point $P(x, y)$ satisfy the relation $xy < 0$, then P may lie on which of the quadrant(s)?

    (a) I, III   (b) II, III   (c) IV, II   (d) III, IV

4. If the radius of the circle is a rational number, then the area is given by a number which is:

    (a) rational number   (b) irrational number

    (c) Integral number   (d) a perfect square number

5. If p(x) = x+3, then p(x) + p(-x) is equal to

   (a) 3   (b) 2x   (c) 0   (d) 6

6. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2:3, then the greater of the two angles is

   (a)54^0 (b) 108^0 (c)120^0 (d) 136^0

7. The number of interwoven isosceles triangles in Sriyantra (in Atharva Veda) is:

   (a)Seven   (b)Eight   (c)Nine   (d)Eleven

8. If $x^2 + kx + 6 = (x +2) (x + 3)$ for all x , then the value of k is

   (a) 1   (b) – 1   (c) 5   (d) 3

9. One angle is equal to three times its supplement. The measure of the angle is

   (a) 130°   (b) 135°   (c) 90°   (d) 120°

10. *Statement A (Assertion)*: $\sqrt{13}$ is an irrational number.

   Statement R (Reason): Square root of a rational number is always irrational.

     (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 and reason (R) is not the correct explanation of assertion (A).
     (c) Assertion (A) is true but reason (R) is false.
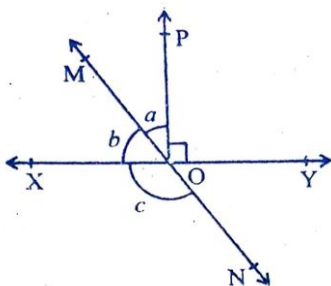   (d) Assertion (A) is false but reason (R) is true.

SECTION-B

11. If $x + y + z = 0$, show that $x^3 + y^3 + z^3 = 3xyz$.
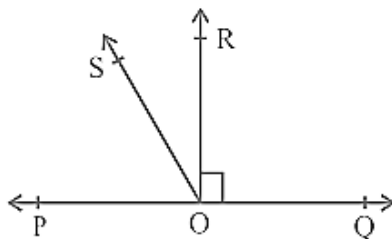
Or

   Factorise: $2x^2 - 7x - 15$

12. In the given figure, lines XY and MN intersect each other at O. If $\angle POY = 90°$ and $a: b = 2: 3$, then find the value of $a + b + c$.

SECTION-C

13. Express $0.12\bar{3}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

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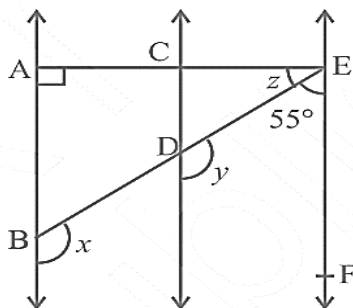

Or

If two lines intersect each other, then show that the vertically opposite angles are equal.

15. If the coordinates of a point M are (-2, 9) which can also be expressed as $(1+x, y^2)$ and $y > 0$, then find the quadrant in which the following points lie:

R(x, y-1), S(2x, -3y).

16. In the following figure, AB || CD and CD || EF. Also EA ⊥ AB. If $\angle$ BEF = 55°, find the values of x, y and z.

SECTION-D

17. Simplify: $\frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{2}+\sqrt{3}}$
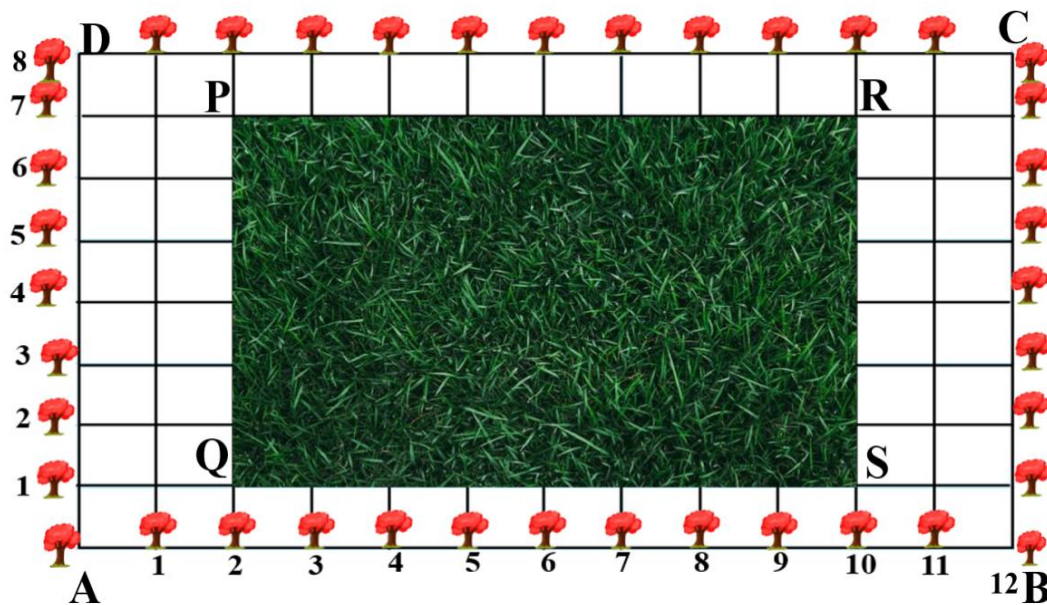
OR

If $m = 7 - 4\sqrt{3}$, then find the value of:

(i)　　$m^2 + \frac{1}{m^2}$　　　　　　(ii) $\sqrt{m} + \frac{1}{\sqrt{m}}$

18. If both $(x - 2)$ and $(x - \frac{1}{2})$ are factors of $p(x) = px^2 + 5x + r$**,** show that $p = r$**.**

SECTION-E

19. The class IX students of a secondary school at Krishna Nagar have been allotted a rectangular plot for gardening activity.

Saplings of Gulmohar are to be planted on the boundary a rectangular plot at a distance of $1m$ from each other. There is a rectangular grassy lawn in the plot as shown in the above figure. The students are instructed to sow seeds of flowering plants on the remaining area of the plot.

Considering AB as X-axis and AD as Y-axis, answer the following questions:

(i) Find the product of the ordinate of the point P and abscissa of the point B.

(ii) Find the coordinates of points Q and R.

(iii) If the grassy lawn to be divided in to two equal halves by joining the diagonal QR, then find the length of QR.

OR

Calculate the ratio of the perimeter of the rectangular plot and the perimeter of the rectangular grassy lawn.