*Cheating Replaces Learning*

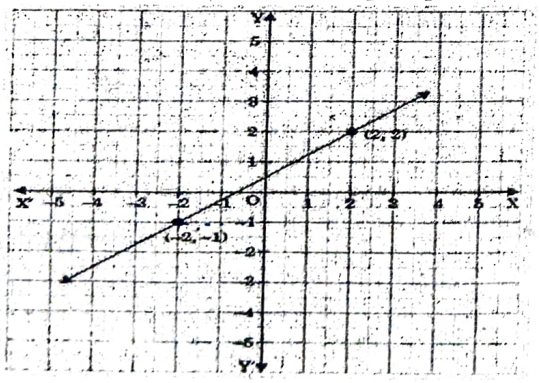
**TERM I**

**M.M: 80** **BVP/IX/Maths/2022-23**

**Time: 3 Hours**

**Section - A (1 mark each)**

1. $\sqrt{7}$ is an irrational number. Which of these will also be an irrational number?
   (i) $(\sqrt{7})^2$
   (ii) $(\sqrt{7})^{-2}$
   (iii) $\sqrt{7} + \sqrt{7}$
   (iv) $(\sqrt{7} + \sqrt{7})(\sqrt{7} - \sqrt{7})$
2. Which of these identities can be used to factorize the expression $x^2 - 3x - 18$?
   (i) $(x-a)^2 = x^2 - 2a + a^2$
   (ii) $(x+a)^2 = x^2 + 2a + a^2$
   (iii) $(x-a)(x-b) = x^2 - (a+b)x + ab$
   (iv) $(x-a)(x+a) = x^2 - a^2$
3. When $(7)^{-7}$ is _____, we get $(7)^{-8}$. Which of these would go in the blank above to make it a true sentence?
   (i) Multiplied by 7
   (ii) Divided by 7
   (iii) Added to 7
   (iv) Added to $\frac{1}{7}$
4. To which equation does the graph represent?

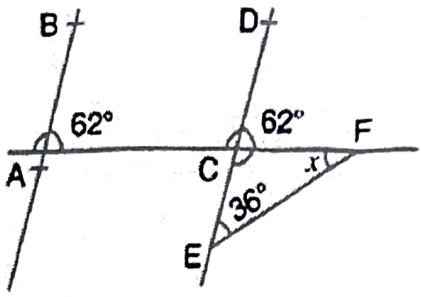



   (i) $3x - 7y = 10$
   (ii) $y - 2x = 3$
   (iii) $8y - 6x = 4$
   (iv) $x + y = 0$

5. In triangles ABC and PQR, AB = AC, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are:
   (i) Isosceles but not congruent.
   (ii) Isosceles and congruent.
   (iii) Congruent but not isosceles.
   (iv) Neither congruent nor isosceles.

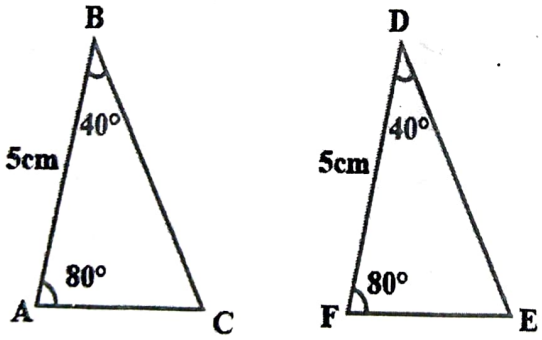
6. John is of the same age as Mohan. Ram is also of the same age as Mohan. State the Euclid's axiom that illustrates the relative ages of John and Ram.
   (i) First Axiom
   (ii) Second Axiom
   (iii) Third Axiom
   **(iv)** Fourth Axiom

7. In the given figure, AB ‖ ED, the value of x is:




(i) 26°
(ii) 36°
(iii) 54°
(iv) 62°

8. The polynomial $p(x) = x^3 - 5x^2 - x + 5$ is such that p (1) = 0 and p (-1) = 0. Which of these is equivalent to p(x)?
   (i) (x-1)(x+5)
   (ii) (x-1)(x+1)(x+5)
   (iii) (x-1)(x+1)(x-5)
   (iv) (x+1)(x-5)




**Congruent triangles**

9. It is given that $\Delta ABC \cong \Delta FDE$ and AB = 5 cm, $\angle B = 40°$ and $\angle A = 80°$. Then which of the following is true?
   (i) DF = 5 cm, $\angle F = 60°$
   (ii) DF = 5 cm, $\angle E = 60°$
   (iii) DE = 5 cm, $\angle E = 60°$
   (iv) DE = 5 cm, $\angle D = 40°$

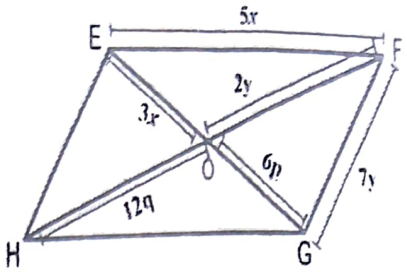
10. Which of these must be true for the given quadrilateral EFGH to be a parallelogram?

(i) $5x = 7y$

(ii) $3x = 12q$

(iii) $3x = 6p$

(iv) $2y = 6p$




11. $(kx + 3y + 2z)^2 = k^2x^2 + 9y^2 + 4z^2 - 12xy + 12yz - 8xz$, then what is k?

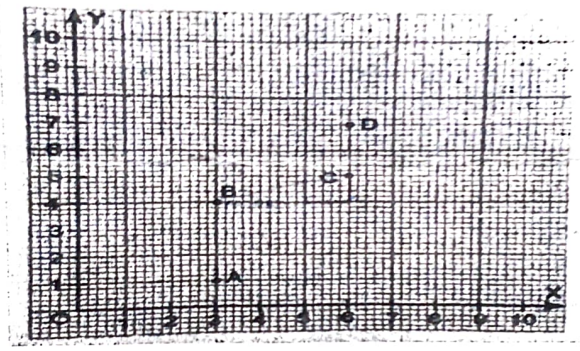
12. State Mid Point Theorem.

13. The ordinate of a point is 11 more than its abscissa. If the abscissa of the point is -9, then what are the coordinates of the point?

14. Write any two Euclid's postulates.

15. The volume of a cube is given by the expression $27x^3 + 8y^3 + 54x^2y + 36xy^2$. What is the expression for the side length of the cube?

**Case Study Question**




Rajan is participating in an 8 miles walk. The organizers use a square coordinate grid to plot the course. The starting point is at A (3, 1). At B (3, 4), there's a water station to make sure the walkers stay hydrated.

From water station, the walkway turns right and at C (6, 4), a garden is situated to keep walkers fresh. From the garden, the walkway turns left and finally, Rajan reaches at destination D to complete 8 miles.

16. How far is the water station B from the starting point A?

(i) 4 miles (iii) 1 mile

(ii) 3 miles (iv) 5 miles

17. How far is the water station B from garden C?

(i) 4 miles (iii) 5 miles

(ii) 3 miles (iv) 7 miles

18. What is the abscissa of destination point D?

(i) 3 (iii) 4

(ii) 5 (iv) 6

19. What are the coordinates of destination point D?

(i) (1,5) (iii) (6,6)

(ii) (6,7) (iv) (6,1)

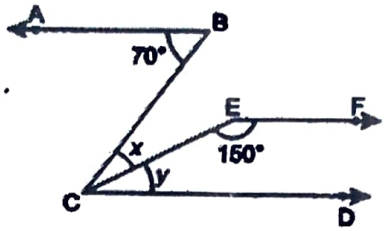
20. What is the ordinate of water station?

(i) 1 (iii) 3

(ii) 2 (iv) 4

**Section - B (2 marks each)**

21. If AB || EF and EF || CD, then find the value of x.




22. AD is an altitude of an isosceles triangle ABC in which AB = AC. Show that

(i) AD bisects BC

(ii) AD bisects ∠A

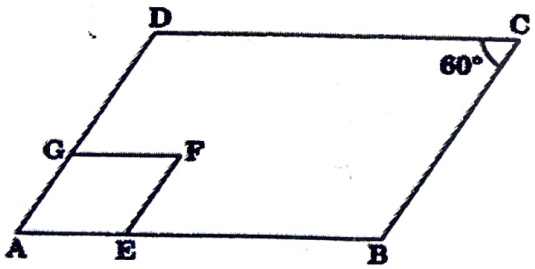
23. The sum of two numbers is 7. The sum of their cubes is 217. What is the product of the two numbers?

24. Is $\frac{1}{\sqrt{5}}(x)^{1/2} + 1a$ a polynomial? Justify your answer.

25. If (p, p+5) is a solution of the linear equation $11x - 2y = 35$, find the value of p?

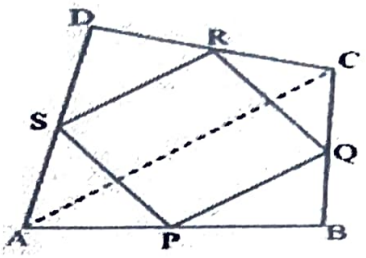
26. If the two points are A $(\frac{13}{2}, 5)$ and B $(4, \frac{-2}{13})$, then what is (abscissa A) – (ordinate B)?

27. In the given figure, ABCD and AEFG are two parallelograms. If ∠C = 60°, then ∠F = 60°. Justify your answer.



## Section - C (3 marks each)

28. ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA (see the given figure). AC is a diagonal.
Show that:




(i) SR || AC and $SR = \frac{1}{2}AC$

(ii) PQ = SR

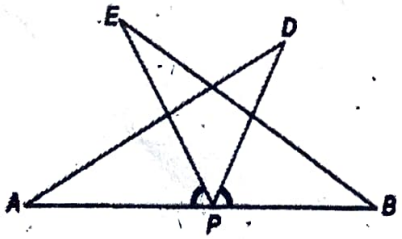
(iii) PQRS is a parallelogram.

29. Represent $\sqrt{8.5}$ on the number line.

30. Write any three equations in two variables of line passing through point (2, 3).

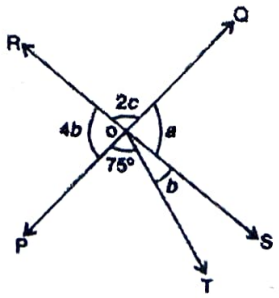
31. Factorize: $x^3 - 6x^2 + 11x - 6$.

32. AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that ∠ BAD = ∠ ABE and ∠ EPA = ∠ DPB. (See figure). Show that
(i) ΔDAP ≅ ΔEBP
(ii) AD = BE




33. On her birthday, Sonia distributed chocolates in an orphanage. She gave 5 chocolates to each child and 20 chocolates to adults. Taking number of children as x and total chocolates distributed as y:
(i) Form a linear equation. (1)
(ii) If she distributed 145 chocolates, how many children are there in an Orphanage? (1)
(iii) Explain the value depicted by Sonia here. (1)

34. In the given figure, two straight lines PQ and RS intersect each other at O.
If ∠POT = 75°, find the values of a, b, c.



## Section - D (5 marks each)

35. Two brothers Ashish and Amit wanted to start a business together. They decided to share their amount depending upon the variable expenditure. The amount of two partners is given by the expression $12x^2 + 11x - 15$, which is the product of their individual share factors.

    On the basis of the above information answer the following questions:

    (i) Find total expenditure of Ashish and Amit when x = Rs 100. (1)

    (ii) Find individual share factor of Ashish and Amit in terms of x. (2)

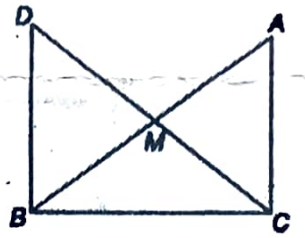
    (iii) Find the value of x if their shares are equal. (1)

    (iv) Find the sum of their expenditure in terms of x. (1)

36. Find a and b, if

$$\frac{2\sqrt{5}+\sqrt{3}}{2\sqrt{5}-\sqrt{3}} + \frac{2\sqrt{5}-\sqrt{3}}{2\sqrt{5}+\sqrt{3}} = a + \sqrt{15}b.$$

37. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B (see figure).




    Show that

    (i) $\Delta AMC \cong \Delta BMD$

    (ii) $\angle DBC$ is a right angle

    (iii) $\Delta DBC \cong \Delta ACB$

    (iv) $CM = \frac{1}{2} AB$

38. It is given that $\angle XYZ = 64°$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$, find $\angle XYQ$ and reflex $\angle QYP$.

39. In a parallelogram ABCD, E and F are the mid-points of sides AB and CD respectively (see figure). Show that the line segments AF and EC trisect the diagonal BD.