



विद्या सर्वार्थ साधिका

ANANDALAYA

PERIODIC TEST – 2

Class: IX

Subject: Mathematics (041)

Date : 25/09/2024

M.M : 80

Time : 3 Hours

General Instructions:

1. This Question paper contains - five sections A, B, C, D and E. Each section is compulsory.
2. Section A has 18 MCQ's and 02 Assertion – Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA) – type questions of 2 marks each.
4. Section C has 6 Short Answer (SA) – type questions of 3 marks each.
5. Section D has 4 Long Answer (LA) – type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based/integrated units of assessment of 4 marks each with sub-parts.
7. All Questions are compulsory. However, an internal choice in 2 questions of 2 marks, 2 questions of 3 marks and 2 Questions of 5 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. Two lines AB and CB intersect at O. If $\angle AOC = 70^\circ$, then value of $\angle BOD =$ _____. (1)
(A) 20° (B) 60° (C) 70° (D) 110°
2. The section formed by horizontal and vertical lines determining the position of the point in a Cartesian plane is known as _____. (1)
(A) Origin (B) X – axis (C) Y-axis (D) Quadrants
3. Axioms are assumed _____. (1)
(A) universal truths in all branches of mathematics (B) theorems
(C) universal truths specific to geometry (D) definitions
4. What is the measure of an angle whose measure is 32° less than its supplement? (1)
(A) 148° (B) 158° (C) 68° (D) 58°
5. The decimal expansion of an irrational number is _____. (1)
(A) Terminating Decimal (B) Recurring Decimal
(C) Either Terminating or Non- Terminating (D) Non- Terminating and Non- Recurring
6. In which quadrant, will the point lies, if the ordinate is -2 and the abscissa is -3 ? (1)
(A) I (B) II (C) III (D) IV
7. Calculate the perimeter of a rectangle whose area is $x^2 - 7x + 10$. (1)
(A) $(4x - 14)$ (B) $(2x - 7)$ (C) $(x - 2)(x - 5)$ (D) $(2x + 7)$
8. Which linear equation is having solutions $(-2, 2)$, $(0, 0)$ and $(2, -2)$. (1)
(A) $y = -x$ (B) $y = x$ (C) $y = 2x$ (D) $x = -2y$
9. If $AB = QR$, $BC = PR$ and $CA = PQ$, which congruency is state true? (1)
(A) $\triangle ABC \cong \triangle PQR$ (B) $\triangle CBA \cong \triangle PRQ$
(C) $\triangle BAC \cong \triangle RPQ$ (D) $\triangle PQR \cong \triangle BCA$

10. Which of the following is an irrational number? (1)
 (A) $\frac{\sqrt{12}}{\sqrt{3}}$ (B) $\frac{\sqrt{18}}{\sqrt{2}}$ (C) $\frac{\sqrt{45}}{\sqrt{5}}$ (D) $\frac{\sqrt{42}}{\sqrt{7}}$
11. Two quantities P and Q are such that $P = Q$. Which of these equations illustrates the Euclid's axiom "If equals are added to equals, the wholes are equals"? (1)
 (A) $P + x = Q - x$ (B) $P + x = Q + x$ (C) $P + x = Q$ (D) $P \times x = Q$
12. If $p(x) = x + 3$, then the value of $p(x) + p(-x)$. (1)
 (A) $2x - 6$ (B) $2x$ (C) 0 (D) 6
13. Abscissa of all the points on the y - axis is _____. (1)
 (A) 0 (B) 1 (C) 2 (D) any number
14. In ΔPQR , $\angle R = \angle P$ and $QR = 4$ cm and $PR = 5$ cm. Then what is the length of PQ? (1)
 (A) 4 cm (B) 5 cm (C) 2 cm (D) 2.5 cm
15. If $x = 0.\bar{3}$, $y = 0.\bar{6}$ then what is the sum of x and y? (1)
 (A) 0 (B) 1 (C) $0.\bar{3}$ (D) $0.\overline{09}$
16. Which of the following needs a proof? (1)
 (A) Theorem (B) Axiom (C) Definition (D) Postulate
17. The value of $249^2 - 248^2$ is _____. (1)
 (A) 12 (B) 477 (C) 487 (D) 497
18. Which points given below does not satisfy the equation $2x + 3y = 12$? (1)
 (A) $(-6, 8)$ (B) $(6, -8)$ (C) $(3, 2)$ (D) $(-3, 6)$

In the following questions 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (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.
19. (A) : Two angles' measures $(a - 60^\circ)$ and $(123^\circ - 2a)$. If each one is opposite to equal sides of an isosceles triangle, then the value of a is 61° . (1)
 (R) : Sides opposite to equal angles of a triangle are equal.
20. (A) : An angle is 14° more than its complementary angle, then angle is 52° . (1)
 (R) : Two angles are said to be supplementary if their sum of measure of angles is 180°

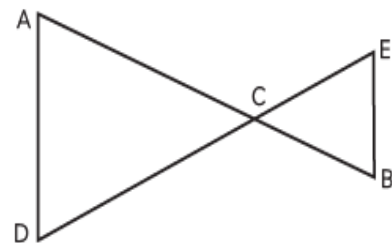
SECTION - B

21. If $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$, find x. (2)
22. In which quadrant the following points lie? $(3, 2)$, $(2, -3)$, $(-4, 4)$ and $(-2, -3)$. (2)

OR

Find the distance of the following points from the origin: P(3, 0), Q(0, -3), R(0, 5), S (-6, 0).

23. In the given figure $AC = DC$, $CB = CE$, then show that $AB = DE$.
Write the axioms used to prove it.



24. The cost of a pen is three times the cost of a pencil. Write a linear equation in two variables to represent this statement. Also write any two costs of pencil and pen. (2)

OR

For what value of k , $x = 2$ and $y = -1$ is a solution of $x + 3y - k = 0$. Write the coordinate of point where line cuts to x-axis.

25. If $p(x) = 2x^3 - 6x^2 + ax + a$, and $(x + 2)$ is a factor of $p(x)$, then find a . (2)

SECTION -C

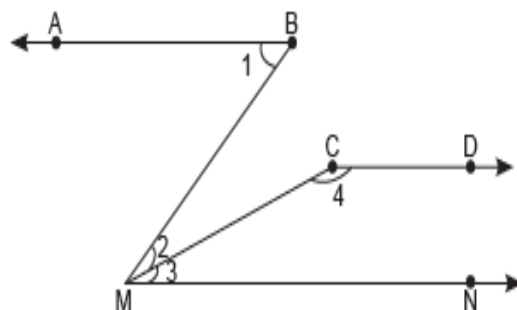
26. Seema donated a certain amount of money to a blind school. Her friend Manya wanted to know the amount donated by her, but Ashima did not disclose the amount she donated, instead she gave her a hint that if $\left(x + \frac{1}{x}\right) = 7$ then the amount donated by her is $\left(x^3 + \frac{1}{x^3}\right)$. Find the amount donated by Seema to the blind school. (3)

27. Find the value of $\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}} + \frac{\sqrt{3}+1}{\sqrt{3}-1}$. (3)

OR

Express $18.\overline{48}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

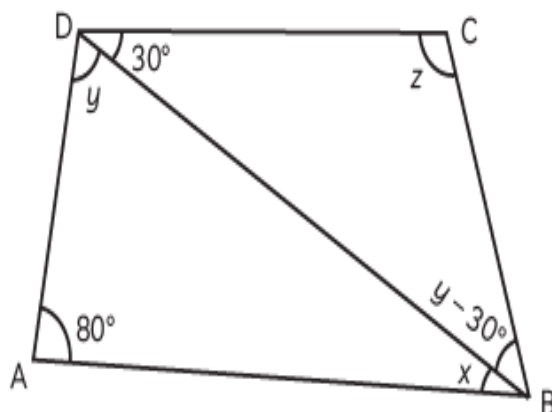
28. In the given figure, $\angle 1 = 60^\circ$, $\angle 2 = 25^\circ$, $\angle 3 = 35^\circ$ and $\angle 4 = 145^\circ$. Prove that $AB \parallel CD$. (3)



OR

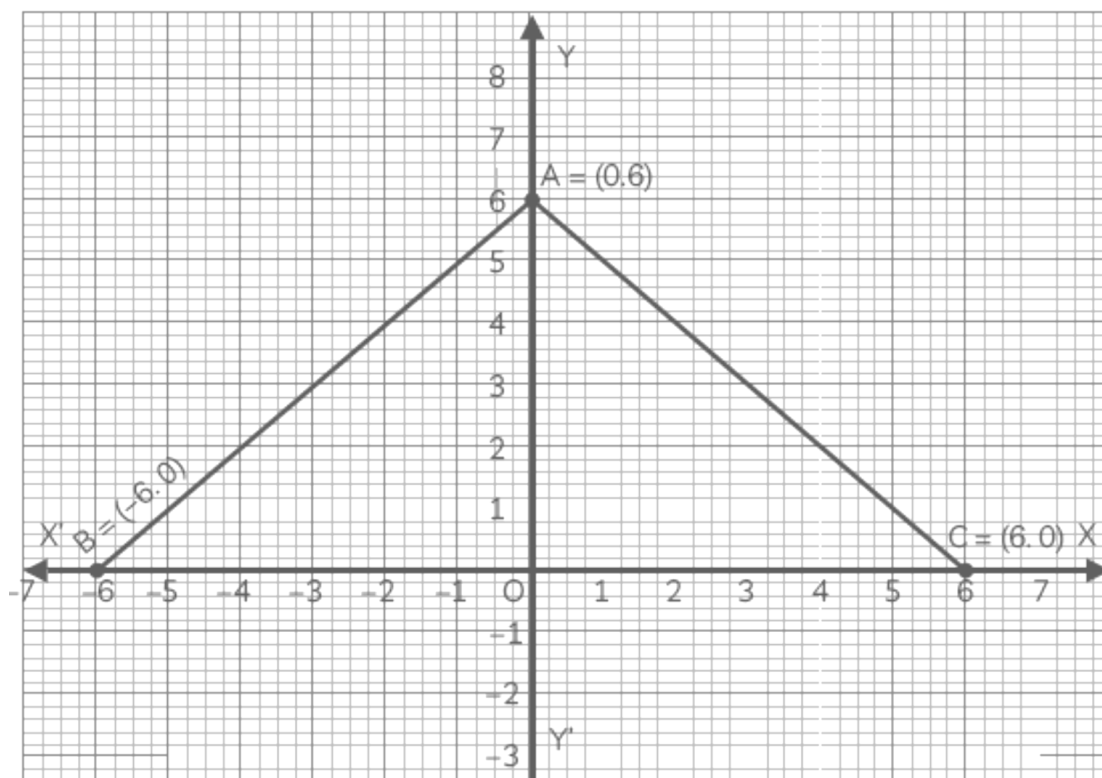
The angles of a triangle ABC are in the ratio 2: 3: 4. Find the largest angle of the triangle.

29. In the given figure if $AB \parallel DC$ and $\angle BDC = 30^\circ$, $\angle BAD = 80^\circ$, find $\angle x$, $\angle y$ and $\angle z$. (3)



30. In the given graph, find the area of triangle ABC.

(3)



31. Find three rational and three irrational number between $\frac{5}{3}$ and $\frac{7}{4}$.

(3)

SECTION -D

32. If $a + b + c = 5$ and $ab + bc + ca = 10$, then prove that $a^3 + b^3 + c^3 - 3abc = -25$.

(5)

OR

Find the value of a and b so that $x + 1$ and $x - 1$ are factors of $x^4 + ax^3 - 3x^2 + 2x + b$.

33. Write the linear equation $y = 9x - 7$ in standard form and write the values of a , b , and c . Also check that the points $P(1, 2)$, $Q(-1, -16)$ and $R(0, -7)$ lie on the graph of the given linear equation?

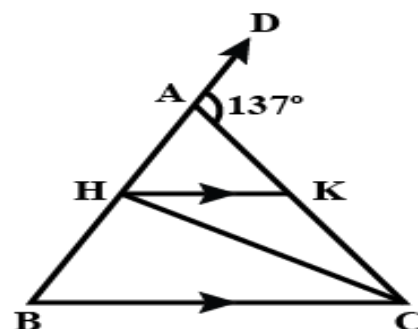
(5)

34. In an isosceles triangle ABC, with $AB = AC$, the bisectors of $\angle B$ and $\angle C$ intersect each other at O . Join A to O . Show that : (i) $OB = OC$ (ii) AO bisects $\angle A$.

OR

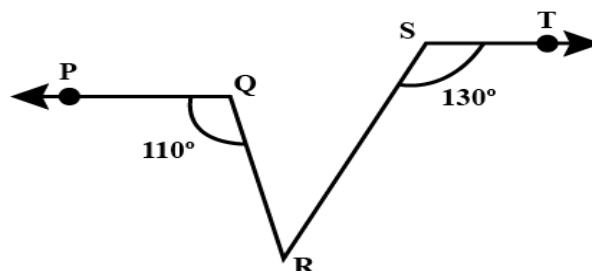
34. In the given figure, $AB = AC$, $CH = CB$ and $HK \parallel BC$. If $\angle CAX = 137^\circ$, then find $\angle CHK$.

(5)



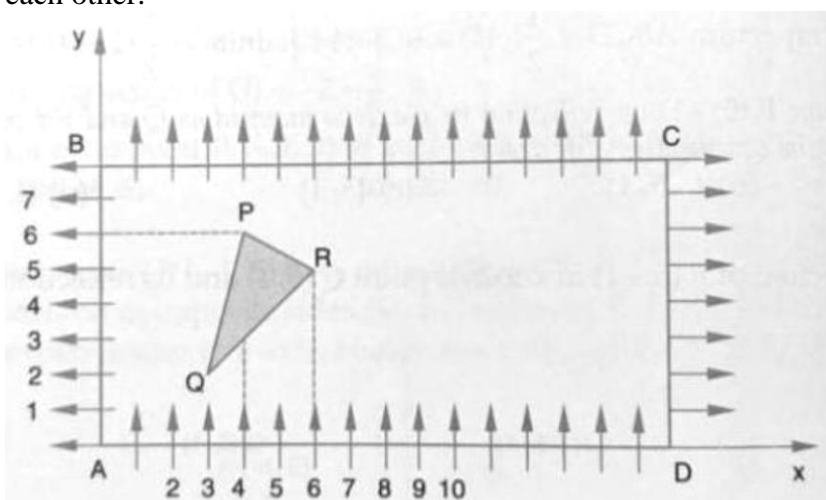
35. In the Figure, if $PQ \parallel ST$, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$, find $\angle QRS$.

(5)



SECTION – E

36. Class IX students of a school have been allotted a rectangular plot of land, adjacent to their school, for gardening activity. Saplings of Ashoka are planted on the boundary at a distance of 1 m from each other.



There is a triangular PQR grassy lawn in the plot as shown in fig. The students are to sow seeds of flowering plants on the remaining area of the plot. Considering A as origin, AD along x axis and AB along y-axis, answer the following questions:

- (i) What is the coordinate of P? (1)
- (ii) What is the abscissa of point R? (1)
- (iii) Find the value of (ordinate of P – ordinate of R). (2)

OR

What will be the coordinates of P, if D is taken as the origin, DA along negative direction of x-axis and DC along y-axis?

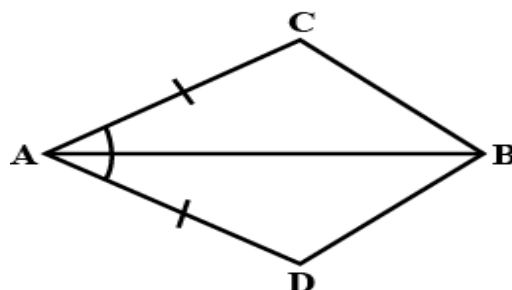
37. Prime Minister's National Relief Fund (also called PMNRF in short) is the fund raised to provide support for people affected by natural and man-made disasters. Natural disasters that are covered under this include flood, cyclone, earthquake etc. Man-made disasters that are included are major accidents, acid attacks, riots, etc. Two friends Sakhee and Maitree, together contributed ₹ 500 towards Prime Minister's Relief Fund. Answer the following:

- (i) If the contribution by Sakhee is ₹ x and by Maitree is ₹ y then, how to represent the above situation in linear equations in two variables? (1)
- (ii) If Sakhee contributed ₹ 230, then how much was contributed by Maitree? (1)
- (iii) If Maitree and Sakhee contributed the amount in 2:3 ratio respectively, then how much was contributed by Sakhee? (2)

OR

If they contributed the amount in 1:1 ratio, then how much is contributed by each?

38. Mrs. Sukanya, a Maths teacher was explaining the topic of "Congruency of triangles" by paper folding method. She took a quadrilateral shaped original sheet ACBD and folded it in such a way from point A and B that AB bisect $\angle A$ and $AC = AD$.



Answer the following questions on the basis of above information.

- (i) $\triangle ABC$ and $\triangle ABD$ are congruent by which congruence criterion? (1)
- (ii) Is $\angle ACB = \angle ADB$? If yes, why? (1)
- (iii) What is meant by CPCT? (2)

OR

- (iii) If $\triangle ABC \cong \triangle ADB$ then $BC =$ _____.