



ANANDALAYA PERIODIC TEST – 2

Class: IX

विद्या सर्वार्थ साधिका

Subject: Mathematics (041)

Date : 29 – 09 – 2023

M.M : 80

Time : 3 Hours

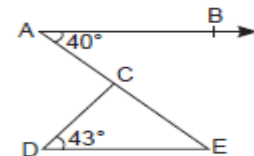
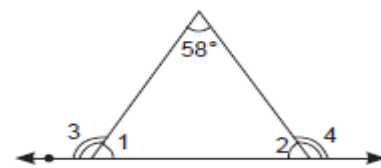
General Instructions:

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, internal choices in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Qs of 2 marks have 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

Section A consists of 20 questions of 1 mark each.

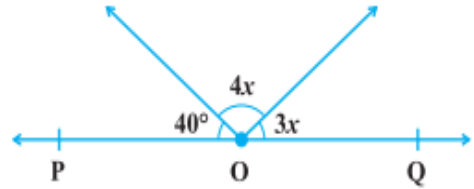
1. If $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$ then $\frac{a}{b} = \underline{\hspace{2cm}}$. (1)
 (A) 2 (B) -2 (C) 3 (D) 4
2. Simplified form of $(\sqrt{2} + \frac{1}{\sqrt{2}})^2$ is . (1)
 (A) 4 (B) $\frac{2}{\sqrt{2}}$ (C) $\frac{2}{9}$ (D) $\frac{9}{2}$
3. Which of the following expression is a polynomial of degree 2? (1)
 (A) $(x^2)^3 + 2x - 8$ (B) $\sqrt{2x^2} - 8$ (C) $y^2 + \frac{1}{y^2}$ (D) $\sqrt{2}x^2 - \sqrt{5}$
4. If $P(x) = x^{51} + 51$, then $P(-1) = \underline{\hspace{2cm}}$. (1)
 (A) 49 (B) -51 (C) 50 (D) 52
5. Where does the point $(0, 2 - \sqrt{3})$ lie? (1)
 (A) x - axis (B) y - axis (C) IV th quadrant (D) Ist quadrant
6. If $\sqrt{2^x} = 64$ then $x = ?$ (1)
 (A) 12 (B) 6 (C) $\frac{1}{12}$ (D) $\frac{1}{6}$
7. Find the value of m if $x = -1$ and $y = 4$ is a solution of the equation $mx - y = -6$. (1)
 (A) -2 (B) 2 (C) -10 (D) 10
8. Which one of the following is the solution of the equation $2x + 3y = 12$. (1)
 (A) $(3, \frac{2}{3})$ (B) $(5, \frac{2}{3})$ (C) $(3, \frac{3}{2})$ (D) (5, 1)
9. In the given figure, $\angle 1 = \angle 2$ then the measurements of $\angle 3$ and $\angle 4$ respectively are . (1)
 (A) $58^\circ, 61^\circ$ (B) $61^\circ, 61^\circ$
 (C) $119^\circ, 61^\circ$ (D) $119^\circ, 119^\circ$



10. In the given figure, $AB \parallel DE$, then measure of $\angle ACD$ is . (1)
 (A) 43° (B) 40° (C) 83° (D) 97°

11. In the given figure, POQ is a line. The value of x is _____

- (A) 20° (B) 25°
 (C) 30 (D) 35°



(1)

12. Angles of a triangle are in the ratio 2 : 4 : 3. The smallest angle of the triangle is _____.

- (A) 20° (B) 40° (C) 25° (D) 80°

(1)

13. Write the coefficient of y in the expansion of $(10 - y)^2$.

- (A) -1 (B) -20 (C) 20 (D) -10

(1)

14. If $a = \sqrt{2} + 1$, find the value of $\left(a - \frac{1}{a}\right)^2$

- (A) 4 (B) -4 (C) 12 (D) $2\sqrt{2}$

(1)

15. Find the remainder when $4x^3 - 3x^2 + 4x - 2$ is divided by $x - 2$.

- (A) 42 (B) -26 (C) 24 (D) 26

(1)

16. In ΔABC , $BC = AB$ and $\angle B = 80^\circ$. Then $\angle A$ is equal to

- (A) 80° (B) 40° (C) 50° (D) 100°

(1)

17. It is given that $\Delta ABC \cong \Delta FDE$ and $AB = 5 \text{ cm}$, $\angle B = 40^\circ$ and $\angle A = 80^\circ$. Then which of the following is true?

- (A) $DF = 5 \text{ cm}$, $\angle F = 60^\circ$ (B) $DF = 5 \text{ cm}$, $\angle E = 60^\circ$
 (C) $DE = 5 \text{ cm}$, $\angle E = 60^\circ$ (D) $DE = 5 \text{ cm}$, $\angle D = 40^\circ$

(1)

18. If $AB = QR$, $BC = PR$ and $\angle B = \angle R$ then _____

- (A) $\Delta ABC \cong \Delta PQR$ (B) $\Delta CBA \cong \Delta PRQ$
 (C) $\Delta BAC \cong \Delta RPQ$ (D) $\Delta PQR \cong \Delta BCA$

(1)

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. Assertion: There is only one rational number lying between $\frac{1}{2}$ and $\frac{1}{3}$

Reason: Rational number lying between two rational numbers x and y is $\frac{1}{2}(x + y)$.

(1)

20. Assertion: In ΔABC , $AB = AC$ and $\angle B = 50^\circ$ then $\angle C = 50^\circ$.

Reason: Angles opposite to equal sides of a triangle are equal.

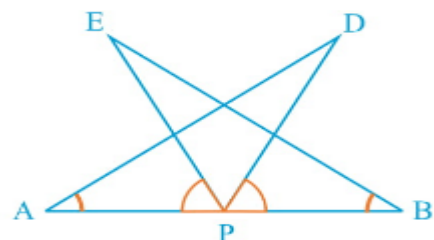
(1)

SECTION - B

Section B consists of 5 questions of 2 marks each.

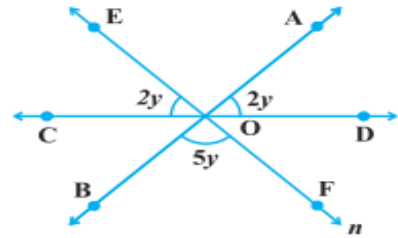
21. AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (see Fig.). Show that

- (i) $\Delta DAP \cong \Delta EBP$ (ii) $AD = BE$



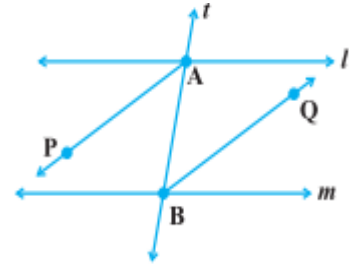
(2)

22. Given AB, CD and EF are three lines intersecting at O. Find the value of y. (2)



OR

AP and BQ are the bisectors of the two alternate interior angles formed by the intersection of a transversal t with parallel lines l and m . Show that $AP \parallel BQ$.



23. Check whether $7 + 3x$ is a factor of $3x^3 + 7x$. (2)

OR

If $a + b + c = 5$ and $ab + bc + ca = 10$, then the value of $a^3 + b^3 + c^3 - 3abc = \underline{\hspace{2cm}}$

24. If $\left(\frac{2}{5}\right)^{2x+1} \times \left(\frac{5}{2}\right)^x = \left(\frac{5}{2}\right)^{2x-10}$ find x . (2)

25. For what value of p ; $x = 2, y = 3$ is a solution of $(p + 1)x - (2p + 3)y - 1 = 0$? (2)

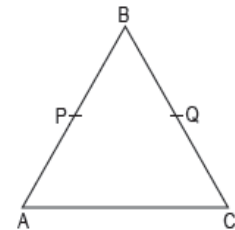
SECTION - C

Section C consists of 6 questions of 3 marks each

26. Express $0.8 + 0.\bar{7} + 0.4\bar{3}$ in the $\frac{p}{q}$ form, where p and q are integers $q \neq 0$ (3)

27. In the given figure, if $AB = BC$ and $AP = CQ$, then prove that $BP = BQ$. (3)

State the axiom which is used for the above proof.

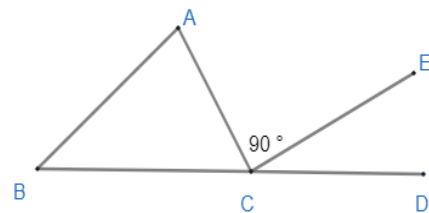


28. If $x = \frac{\sqrt{2}+1}{\sqrt{2}-1}$, $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$, then show that $x^2 + y^2 + xy = 35$. (3)

OR

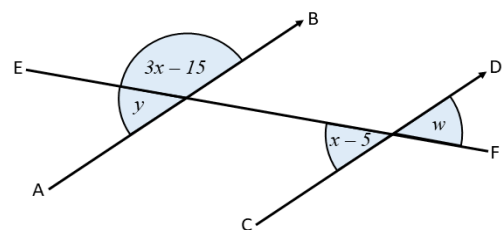
If $\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + 7\sqrt{5}b$, find a and b .

29. In the figure, side BC of ΔABC has been produced to D. If $\angle A : \angle B : \angle C = 3 : 2 : 1$ and $CE \perp AC$, find $\angle ECD$. (3)



OR

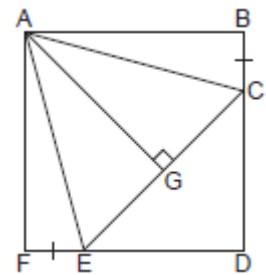
The diagram shows two parallel lines, AB and CD, crossed by a transversal line EF. Find the values of x, y and w .



30. ABDF is a square and BC = EF in the given figure. Prove that

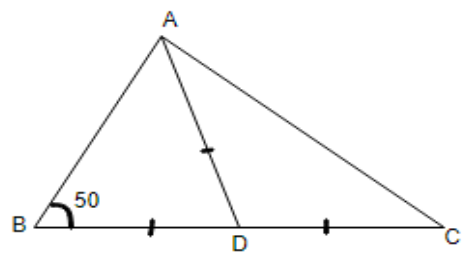
(i) $\Delta ABC \cong \Delta AFE$

(ii) $\Delta ACG \cong \Delta AEG$



(3)

31. In the figure, D is the midpoint of the side BC of ΔABC and $\angle ABD = 50^\circ$. If $AD = BD = DC$, find the measure of $\angle ACD$.

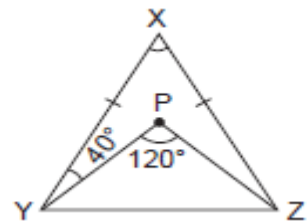


(3)

SECTION –D

Section D consists of 4 questions of 5 marks each

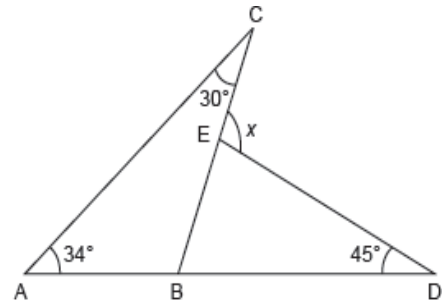
32. In the given figure, ΔXYZ and ΔPYZ are two isosceles triangle on the same base YZ with $XY = XZ$ and $PY = PZ$. If $\angle P = 120^\circ$ and $\angle XYP = 40^\circ$, then find $\angle YXZ$.



(5)

OR

In the given figure, find the value of x .



33. Find four different solutions of the equation $x + 2y = 6$. Plot these points on a graph paper and show all points lie on a line. (5)

34. Two polynomials $p(x) = ax^3 + 3x^2 - 13$ and $q(x) = 2x^3 - 5x + a$ when divided by $x + 2$ gives the same remainder. Find the value of a . (5)

OR

Factorise using factor theorem: $x^3 - 6x^2 + 11x - 6$.

35. Show that : $\frac{1}{3+\sqrt{7}} + \frac{1}{\sqrt{5}+\sqrt{7}} + \frac{1}{\sqrt{3}+\sqrt{5}} + \frac{1}{1+\sqrt{3}} = 1$ (5)

SECTION – E

Section E consists of three case study questions

36. Students of a school are standing in rows and columns in their playground for a game. A, B, C and D are the positions of four students as shown in the figure. Use the concepts of co-ordinate geometry to find the following.

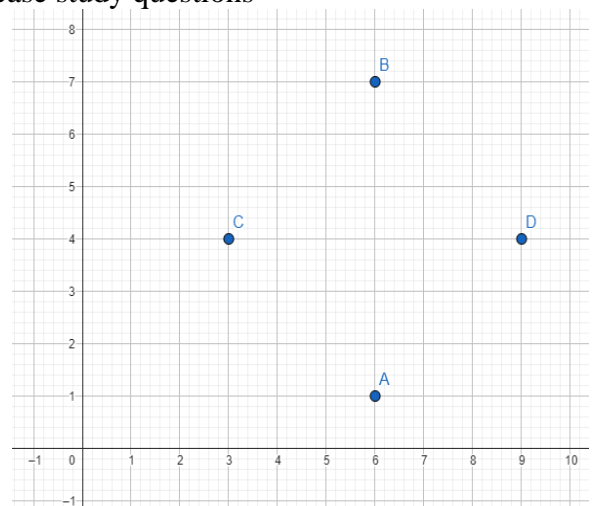
i) Write the co-ordinates of A and B.

ii) Distance between C and D = _____

iii) Abscissa of C - Ordinate of D = _____

OR

iii) Perpendicular distance of the point D from $y - axis =$ _____.



(1)

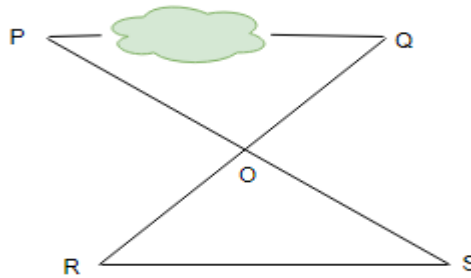
(1)

(2)

- 37 The parking charges of a car at Vadodara Railway station is ₹ 50 for the first 4 hours and ₹ 10 for subsequent hours. Taking total parking time to be x hours and total charges as ₹ y , answer the following.
- Write the linear equation to express the above statement. (1)
 - Mansi parked her car for 7 hours. How much amount she has to pay for parking? (1)
 - Mansi wanted to draw the graph of the linear equation, help her to find two sets of co-ordinates. (2)

OR

- iii) Graph of the linear equation intersect y - axis at the point whose co-ordinates are _____.
- 38 During education tour of class IX, the teacher asked the students to measure the distance between the two objects P and Q including an obstacle between them. This obstacle prevents the students for direct measurement. One of the students devises an ingenious solution to the problem. Firstly, she fixes a pole at a convenient point O so that both P and Q are visible. Then, she fixes another pole at point S on the line PO produced such that $PO = SO$. In a similar way, she fixes a third pole at point R on the extended line QO such that $QO = RO$. Then she measures the distance between R and S.



- Is she able to measure the distance between P and Q? (1)
- Which congruence condition can be applied here to find the distance PQ? (1)
- Is $\Delta ORS \cong OQP$? why? (2)

OR

- iii) If $\angle POQ = 95^\circ$, $\angle QOS = ?$