ANANDALAYA
PERIODIC TEST – 3
Class : IX

Subject: Mathematics

Date : 07/01 / 2020

M.M: 80

Time: 3 Hours

General Instructions:

i)   All the questions are compulsory.
ii)   The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
iii)   Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
iv)   There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
v)   Use of calculators is not permitted.

SECTION-A

Q 1- Q 10 are multiple choice questions. Select the most appropriate answer from the given options.

1. If $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$, both $a \ and \ b$ are rational numbers, the values of $a \ and \ b$ are_____.   (1)
    a) $a = 2$, $b = -1$ b) $a = -2, b = -1$ c) $a = 2, \ b = 1$ d) $a = 4$, $b = 2$

2. If $f(x) = 5x^2 - 4x + 5$ then the value of $f(1) + f(0) =$ _____.   (1)
    a) 10   b) 11   c) 9   d) none of these.

3. Find the value of β, so that $x = 1$ and $y = 1$ is a solution of the equation $5\beta x + 30\beta y = -70$.   (1)
    a) 2   b) -2 c) $\frac{1}{2}$ d) $-\frac{1}{2}$.

4. Find the coordinates of a point whose ordinate is 6 and lies on the y-axis   (1)
    a) $(0, \ 6)$ b) $(0, -6)$ c) $(6, \ 6)$ d) $(6, \ 0)$.

5. In the given figure, if ∠ AOC = 50° then find the measure of (∠AOD +∠ COB).   (1)

    a) 130°   b) 100°   c) 260°   d) 180°

6. Two sides of a triangle are of lengths 5 cm and 1.5 cm. The length of the third side of the triangle cannot be _____.
    a) 3.6 cm   b) 4.1 cm   c) 3.8 cm   d) 3.4 cm

7. Diagonals AC and BD of parallelogram ABCD intersect at O. If ∠ BOC = 90° and ∠ BDC = 50°,   (1)
    find ∠ OAB.
    a) 30°   b) 60°   c) 45 °   d) 40°
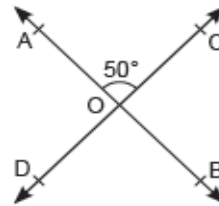
8. ABCD is a parallelogram and X is the mid-point of AB. If $ar(AXCD) = 24\ cm^2$, then (1)

   $ar(\Delta\ ABC) =$ _____.

   a) $24\ cm^2$ b) $16\ cm^2$ c) $8\ cm^2$ d) $32\ cm^2$

9. In the given figure, ABCE is a cyclic quadrilateral and O is the (1)
   centre of circle. If ∠AEC = 110°, then find ∠ADC .

   a) 90°   b) 60°   c) 70°   d)
   110°
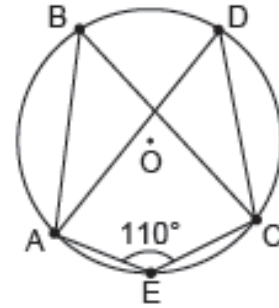
10. The area of trapezium is 475 cm^2 and its height is 19 cm. Find the length of its two parallel sides, if (1)
    one side is 40 cm greater than the other.
    a) 10 cm and 45 cm   b) 5 cm and 45 cm   c) 5 cm and 40 cm   d) 15 cm and 40 cm .
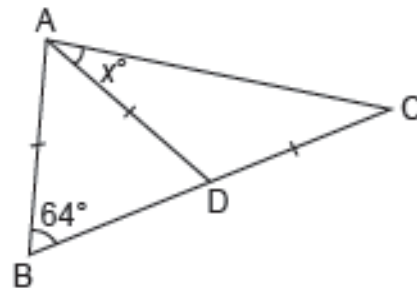
    (Q 11- Q 15) Fill in the blanks

11. The perpendicular distance of the point P(5, 7) from the *y*-axis is _____. (1)

12. $\sqrt{2^{(x+3)}} = 16$ then the value of x = _____. (1)

13. The remainder when $4x^3 - 3x^2 + 4x - 2$ is divided by $x - 2$ is _____. (1)

14. In the figure PQ ‖ RS, and *l* is transversal, then the value (1)
    of *x* equal to _____.
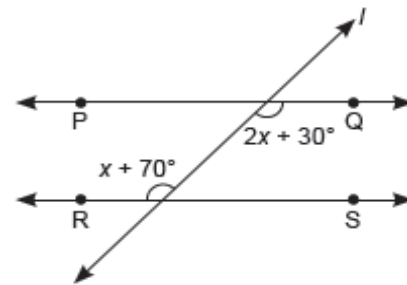
15. In Δ ABC, BC = AB and ∠ B = 80°. Then ∠ A is equal to _____. (1)

    OR

    Δ BAD and ΔADC are two isosceles triangles. If ∠ABD
   = 64°, ∠DAC =_____.

(Q 16- Q 20) Answer the following.

16. Age of x is more than the age of y by 10 years. Express this statement in linear equation $ax + by + c = 0$. (1)

17. A diagonal of a rectangle is inclined to one side of the rectangle at 25°. Find the acute angle between the diagonals. (1)

18. D and E are the mid-points of BC and AD respectively of Δ ABC. If area of Δ ABC = 40 cm^2, find area of Δ EBD. (1)
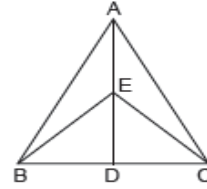
19. AD is a diameter of a circle and AB is a chord. If AD = 34 cm, AB = 30 cm, find the distance of AB from the centre of the circle. (1)

OR

If O is the centre of the circle as shown in the figure, find $\angle$ CBD.
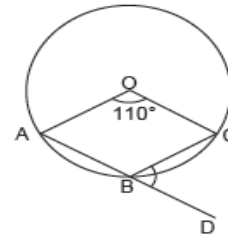
20. The perimeter of an equilateral triangle is 60 cm. Find its area. (Use $\sqrt{3}$ = 1.73) (1)

SECTION-B

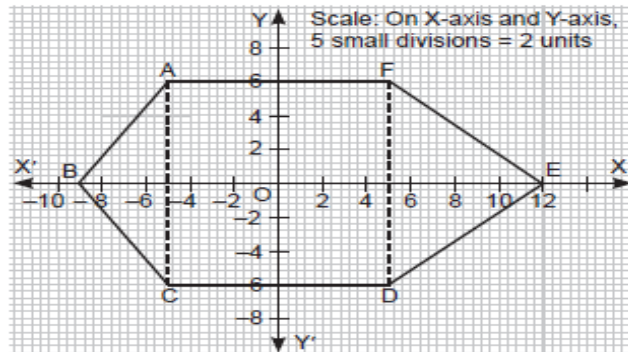21. Simplify : $9^{\frac{3}{2}} - 3 \times 2^0 - \left(\frac{1}{81}\right)^{-\frac{1}{2}}$. (2)

OR

If $\dfrac{9^x \times 3^5 \times (27)^3}{3 \times (81)^4} = 27$, find x .

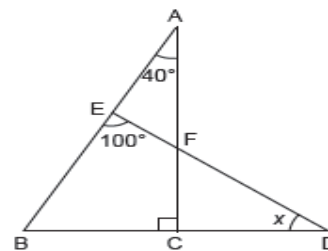22. Factorise: $1 - 2ab - (a^2 + b^2)$. (2)

OR

Find the value of k, if $x + k$ is factor of the polynomial $x^3 - (k^2 - 1) x + 3$

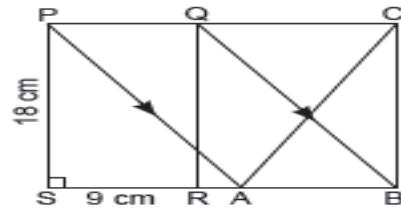23. Write the coordinates of the point A, B, C and D of the figure formed on the graph. (2)

24. Find x, from the given figure. (2)

25. Angles of a quadrilateral are in the ratio 3 : 4 : 4 : 7. Find all the angles of the quadrilateral. (2)

26. In a rectangle PQRS, PS = 18 cm and SR = 9 cm.
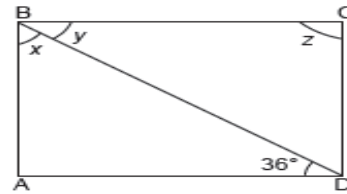   Find area of Δ ABC . (2)

SECTION-C

27. Find the value of a If the polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by $(x + 1)$ leaves the remainder 19. (3)

OR

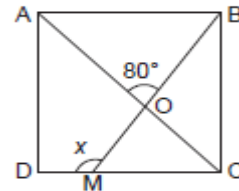If a + b + c = 6 and $a^2 + b^2 + c^2$ = 20, find ab + bc + ca.

28. Draw the graph of the linear equation $-4x + 5y = -40$ and find the point on the graph where abscissa is 0 and write the value of ordinate. (3)

29. In the given figure, AB ∥ DC, $x = \frac{4y}{3}$ and $y = \frac{3z}{8}$ Find ∠BCD, ∠ABC and ∠BAD (3)
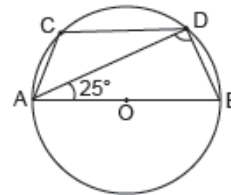

OR
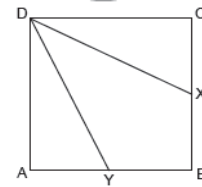
In the given figure, ABCD is a square. A line BM intersects CD at M and diagonal AC at O such that ∠ AOB = 80°. Find the value of x.

30. In the given figure, AB is diameter of the circle with centre O and CD ∥ AB. If ∠ DAB = 25°, then find the measure of ∠ CAD . (3)
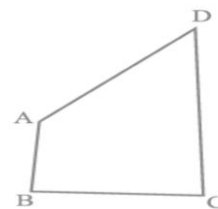

31. ABCD is a square and BX = BY. Prove that (3)
    (i) △ DCX ≅ △ DAY
    (ii) DY = DX
    (iii) ∠ DXC = ∠ DYA
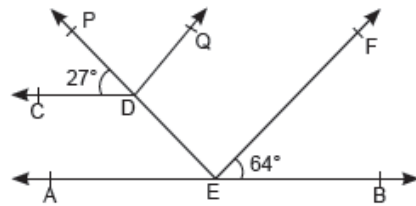

OR

AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD. Show that ∠ A > ∠ C and
$$∠ B > ∠ D$$

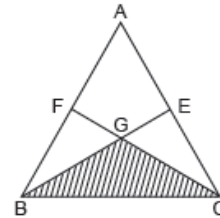32. In the given figure, EF ‖ DQ and AB ‖ CD. (3)
    If $\angle$ FEB = 64°, $\angle$ PDC = 27°, then find
    $\angle$ PDQ, $\angle$ AED and $\angle$ DEF.

33. A reservoir is in the shape of quadrilateral whose sides taken in order are 9 m, 40 m, 15 m and 28 m. (3)
    If the angle between first two sides is a right angle, find the area of the reservoir.

34. The medians BE and CF of a Δ ABC intersect (3)
    at G. Prove that ar(ΔGBC) = ar (AFGE)

SECTION-D

35. If $x = 5 - \sqrt{24}$, find the value of $\left(x^3 + \frac{1}{x^3}\right) - 10 \left(x^2 + \frac{1}{x^2}\right) + 4 \left(x + \frac{1}{x}\right) - 30.$ (4)
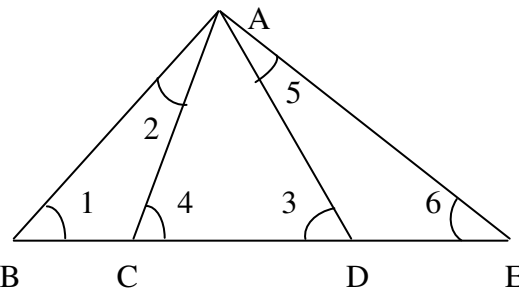
36 Two parallel sides of a trapezium are 120 cm and 154 cm and other sides are 50 cm and 52 cm. Find (4)
    the area of trapezium.

37. Factorise: $x^3 + 6x^2 + 11x + 6.$ (4)

    OR

    Let R_1 and R_2 are the remainders when polynomial $f(x) = 4x^3 + 3x^2 + 12ax - 5$ and
    $g(x) = 2x^3 + ax^2 - 6x - 2$ are divided by $(x - 1)$ and $(x - 2)$ respectively. If $3R_1 + R_2 - 28 = 0$, find
    the value of a.

38. In the figure, show that (4)
    $\angle 1 + \angle 2 + \angle 3 = \angle 4 + \angle 5 + \angle 6.$

39. Prove that "the angle subtended by an arc at the centre is double the angle subtended by it at any (4)
    point on the remaining part of the circle".

    OR

    Parallelograms on the same base and between the same parallels have equal area.

40. Construct a triangle PQR, such that sum of its all sides is 10.4 cm, $\angle$ B = 60° and $\angle$ C = 40°. (4)

    OR

    Construct a triangle ABC in which BC = 8 cm, $\angle$ B = 30° and AB – AC = 3.5 cm.