



THE NANDYAL PUBLIC SCHOOL :: NANDYAL

Series TNPS/11/03

SET – 3

ROLL No.

Q.P Code 09/11/03

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Candidates must write the Q.P
Code on the title page of the
Answer book.



General Instructions :

Read the following instructions carefully and follow them :

- This question paper contains **38** questions. **All** questions are **compulsory**.
- This question paper is divided into **five** Sections – **A, B, C, D** and **E**.
- In **Section A**, Question numbers **1** to **18** are multiple choice questions (MCQs) and question numbers **19** and **20** are Assertion – Reason based questions of **1** mark each.
- In **Section B**, Question numbers **21** to **25** are very short answer (VSA) type questions, carrying **2** marks each.
- In **Section C**, Question numbers **26** to **31** are short answer (SA) type questions, carrying **3** marks each.
- In **Section D**, Question numbers **32** to **35** are long answer (LA) type questions carrying **5** marks each.
- In **Section E**, Question numbers **36** to **38** are **case-study based integrated** questions carrying **4** marks each. Internal choice is provided in **2** marks question in each case-study.
- There is no overall choice. However, an internal choice has been provided in **2** questions in **Section B**, **2** questions in **Section C**, **2** questions in **Section D** and **3** questions of **2** marks in **Section E**.
- Draw neat diagrams wherever required. Take $\pi = \frac{22}{7}$ wherever required, if not stated.
- Use of calculators is **NOT** allowed.



गणित (मानक)

MATHEMATICS (STANDARD)



निर्धारित समय : 3 घण्टे

Time allowed : 3 hours

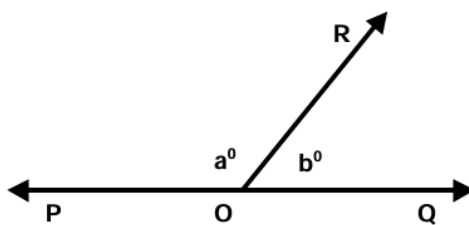
अधिकतम अंक : 80

Maximum Marks : 80

SECTION – A

Questions 1 to 20 carry 1 mark each.

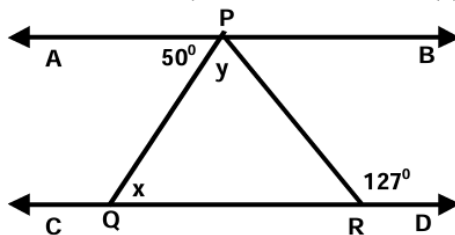
1. The value of $(\sqrt{5} + \sqrt{2})^2$ is:
(a) $7 + 2\sqrt{5}$ (b) $1 + 5\sqrt{2}$ (c) $7 + 2\sqrt{10}$ (d) $7 - 2\sqrt{10}$
2. The value of $9^{\frac{3}{2}}$ is :
(a) 18 (b) 27 (c) - 18 (d) $\frac{1}{27}$
3. If $\left(\frac{3}{4}\right)^6 \times \left(\frac{16}{9}\right)^5 = \left(\frac{4}{3}\right)^{x+2}$, then the value of x is
(a) 2 (b) 4 (c) -2 (d) 6
4. The value of $p(x) = 5x - 4x^2 + 3$ for $x = -1$ is:
(a) 6 (b) -6 (c) 3 (d) -3
5. In fig. $\angle POR$ and $\angle QOR$ form a linear pair if $a - b = 80^\circ$ then values of a and b respectively are:



- (a) 130° and 50° (b) 50° and 130° (c) 60° and 120° (d) 40° and 140°
6. On dividing $x^3 + 3x^2 + 3x + 1$ by $5 + 2x$ we get remainder:
(a) $\frac{8}{27}$ (b) $\frac{27}{8}$ (c) $-\frac{27}{8}$ (d) $-\frac{8}{27}$
 7. How many linear equations in x and y can be satisfied by $x = 1$ and $y = 2$?
(a) only one (b) two (c) infinitely many (d) three
 8. $x = 5, y = 2$ is a solution of the linear equation
(a) $x + 2y = 7$ (b) $5x + 2y = 7$ (c) $x + y = 7$ (d) $5x + y = 7$

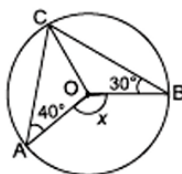
9. The graph of the linear equation $2x + 3y = 6$ is a line which meets the x axis at the point
 (a) (2, 0) (b) (0, 3) (c) (3, 0) (d) (0, 2)

10. In fig., $AB \parallel CD$, $\angle APQ = 50^\circ$, $\angle PRD = 127^\circ$, then the value of x and y respectively are
 (a) 50° and 77° (b) 40° and 85° (c) 60° and 90° (d) 85° and 75°

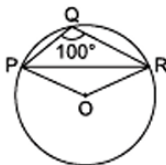


11. An angle is 20° more than three times the given angle. If the two angles are supplementary the angles are
 (a) 20° and 160° (b) 40° and 140° (c) 60° and 120° (d) 70° and 110°

12. In the given figure, O is the centre of the circle. The value of x is
 (a) 140° (b) 70° (c) 290° (d) 210°



13. In the given figure, the value of $\angle OPR$ is
 (a) 65° (b) 10° (c) 20° (d) 50°



14. $\triangle ABC$ is right triangle in which $\angle A = 90^\circ$ and $AB = AC$. The values of $\angle B$ and $\angle C$ will be
 (a) $\angle B = \angle C = 60^\circ$ (b) $\angle B = \angle C = 30^\circ$
 (c) $\angle B = \angle C = 45^\circ$ (d) $\angle B = \angle C = 50^\circ$
15. Three angles of a quadrilateral are 75° , 90° and 75° . The fourth angle is
 (a) 90° (b) 95° (c) 105° (d) 120°

16. If the area of an equilateral triangle is $16\sqrt{3} \text{ cm}^2$, then the perimeter of the triangle is:
 (a) 64 cm (b) 60 cm (c) 36 cm (d) none of these

17. The area of the triangle whose sides are 42 cm, 34 cm and 20 cm in length is
 (a) 150 cm^2 (b) 336 cm^2 (c) 300 cm^2 (d) none of these

18. In a frequency distribution, the mid-value of a class is 10 and width of each class is 6. The lower limit of the class is
 (a) 6 (b) 7 (c) 8 (d) 12

DIRECTION: In the question number 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**.
 Choose the correct option

19. **Assertion (A):** Supplement of angle is one fourth of itself. The measure of the angle is 144° .
Reason (R): Two angles are said to be supplementary if their sum of measure of angles is 180° .

- (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 but 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.

20. Assertion (A): In $\triangle ABC$, $AB = AC$ and $\angle B = 50^\circ$, then $\angle C$ is 50° .

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

- (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 but 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

Questions 21 to 25 carry 2 marks each.

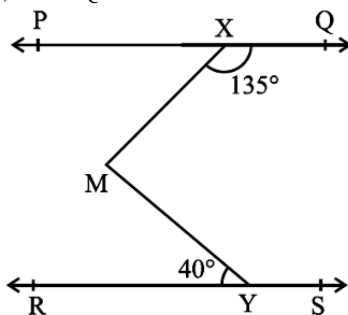
21. Simplify: $(256)^{(-\frac{3}{4})}$

OR

Show that $1.\overline{235}$ can be expressed in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

22. Expand: $(4a - b + 2c)^2$

23. In the below figure, if $PQ \parallel RS$, $\angle MXQ = 135^\circ$ and $\angle MYR = 40^\circ$, find $\angle XMY$.



24. In $\triangle ABC$, the bisector AD of $\angle A$ is perpendicular to side BC. Show that $AB = AC$ and $\triangle ABC$ is isosceles.

25. A right triangle ABC with sides 5 cm, 12 cm and 13 cm is revolved about the side 12 cm. Find the volume of the solid so obtained.

OR

A hemispherical bowl has a radius of 3.5 cm. What would be the volume of water it would contain?

SECTION – C

Questions 26 to 31 carry 3 marks each.

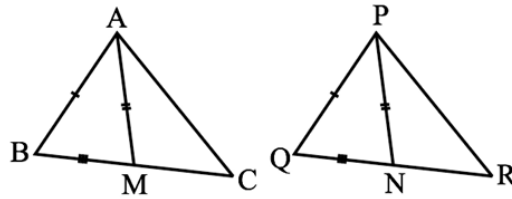
26. Factorise: (i) $6x^2 + 7x - 3$ (ii) $2x^2 - 7x - 15$

OR

Factorise: (i) $27y^3 + 125z^3$ (ii) $64m^3 - 343n^3$

27. If $a + b + c = 9$ and $ab + bc + ca = 26$, find $a^2 + b^2 + c^2$.

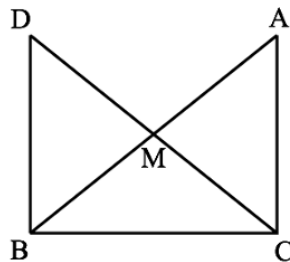
28. Write the statement of Euclid's fifth postulate. How would you rewrite Euclid's fifth postulate so that it would be easier to understand?
29. Find the value of k , if $x = 3$, $y = 2$ is a solution of the equation $2x + 3y = k$.
Find the points where the graph of the above equation cuts the x -axis and the y -axis.
30. If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal.
31. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\triangle PQR$ (see below figure). Show that:
(i) $\triangle ABM \cong \triangle PQN$ (ii) $\triangle ABC \cong \triangle PQR$



OR

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 below figure). Show that:

- (i) $\triangle AMC \cong \triangle BMD$
(ii) $\angle DBC$ is a right angle.
(iii) $\triangle DBC \cong \triangle ACB$

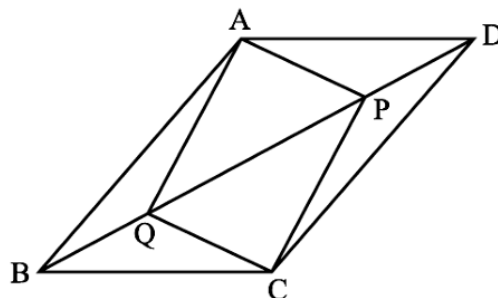


SECTION – D

Questions 32 to 35 carry 5 marks each.

32. Evaluate: $\frac{1}{\sqrt{2}+1} + \frac{1}{\sqrt{3}+\sqrt{2}} + \frac{1}{\sqrt{4}+\sqrt{3}} + \dots + \frac{1}{\sqrt{9}+\sqrt{8}}$

33. In parallelogram $ABCD$, two points P and Q are taken on diagonal BD such that $DP = BQ$ (see below figure). Show that:



- (i) $\triangle APD \cong \triangle CQB$ (ii) $AP = CQ$ (iii) $\triangle AQB \cong \triangle CPD$
(iv) $AQ = CP$ (v) $APCQ$ is a parallelogram

OR

ABCD is a rhombus and P, Q, R and S are the mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rectangle.

34. Draw histogram and frequency polygon for the following distribution:

C. I.	0 – 50	50 – 100	100 – 150	150 – 200	200 – 250	250 – 300
F	4	8	16	13	6	3

35. At a Ramzan Mela, a stall keeper in one of the food stalls has a large cylindrical vessel of base radius 15 cm filled up to a height of 32 cm with orange juice. The juice is filled in small cylindrical glasses (see below figure) of radius 3 cm up to a height of 8 cm, and sold for Rs 3 each. How much money does the stall keeper receive by selling the juice completely?

OR

Monica has a piece of canvas whose area is 551 m^2 . She uses it to have a conical tent made, with a base radius of 7 m. Assuming that all the stitching margins and the wastage incurred while cutting, amounts to approximately 1 m^2 , find the volume of the tent that can be made with it.

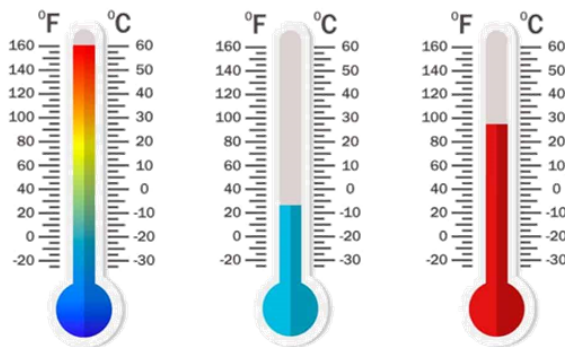
SECTION – E (Case Study Based Questions)

Questions 36 to 38 carry 4 marks each.

36. Case Study – 1

Temperature can be measured in both Fahrenheit and Celsius scale. Both are the standard units for measuring temperature. There is a conversion formula by which Fahrenheit temperature can be converted into Celsius temperature. This formula is in the form of a linear equation:

$$F = \left(\frac{9}{2}\right)C + 32, \text{ where, F and C are the temperatures in Fahrenheit and Celsius.}$$



- (i) If Celsius scale is taken on x-axis, then what is the point on X-axis, where this linear equation cuts the X-axis. [1]

- (ii) At what point does this linear equation, cut the Y-axis ? [1]

- (iii) If the temperature is 30°C , then what is the temperature in Fahrenheit? [2]

OR

- (iii) If the temperature is 95°F , what is the temperature in Celsius? [2]

37. Case Study – 2

Triangles are used in bridges because they evenly distribute weight without changing their proportions. When force is applied on a shape like a rectangle it would flatten out. Before triangles were used in bridges, they were weak and could not be very big. To solve that problem engineers would put a post in the middle of a square and make it more sturdy. Isosceles triangles were used to construct a bridge in which the base (unequal side) of an isosceles triangle is 4 m and its perimeter is 20 m.



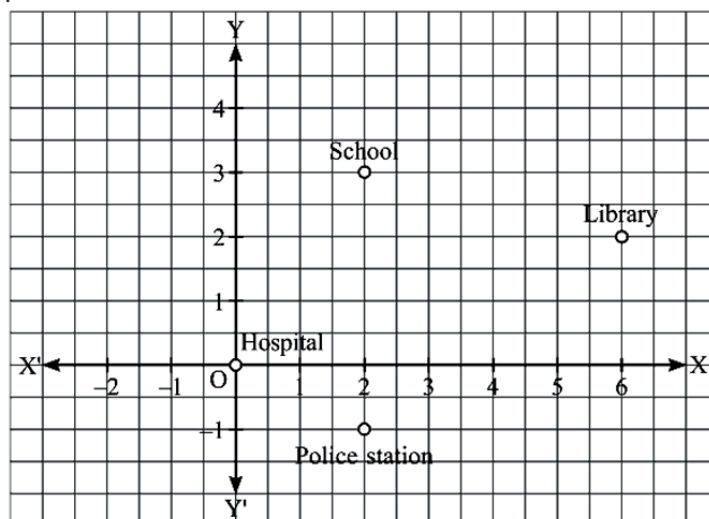
- (i) What is the length of equal sides? [1]
- (ii) In a $\triangle ABC$ it is given that base = 12 m and height = 5 m. Find its area. [1]
- (iii) What is the area of the given isosceles triangle? [2]

OR

- (iii) Find the cost of covering the sheet for one isosceles triangle at the rate of Rs 200 per metre. [2]

38. Case Study – 3

Aditya is a Class IX student residing in a village. One day, he went to a city Hospital along with his grandfather for general checkup. From there he visited three places - School, Library and Police Station. After returning to his village, he plotted a graph by taking Hospital as origin and marked three places on the graph as per his direction of movement and distance. The graph is shown below:



Answer the following questions:

- (i) What are the coordinates of Library? [1]
- (ii) In which quadrant the point (-1, 4) lies? [1]
- (iii) What are the coordinates of School and Police Station? Find the distance between school and police station. [2]

OR

- (iii) Find the distance between Hospital and Library. [2]

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