



Delhi Public School, Howrah

Periodic Assessment – I (2025 – 2026)

Class-X

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

Subject: - Mathematics (Code No - 041)

Time: 1 Hour 30 Minutes

F.M. : 40

General Instructions:

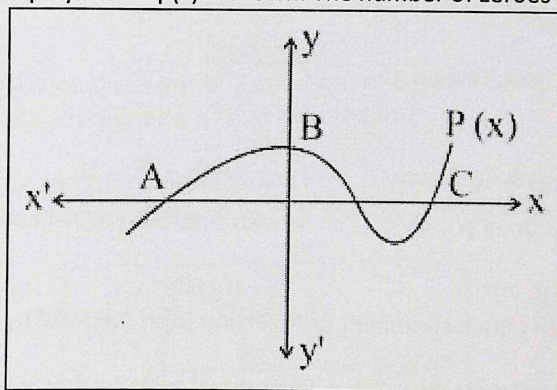
Read the following instructions carefully and follow them.

1. This question paper contains 19 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-9 are multiple choice questions (MCQs) and question no. 10 is Assertion- Reason based question of 1 mark each.
4. In Section B, Questions no. 11-13 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 14-15 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 16-17 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 18-19 are case-study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 1 Question of Section B, 1 Question of Section C and 1 Question of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.

Section A

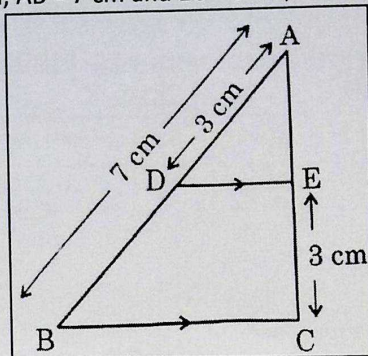
(Section A consists of 10 questions of 1 mark each)

- 1) Three alarm clocks ring their alarms at regular intervals of 20 minutes, 25 minutes and 30 minutes respectively. If they first beep together at 12 noon, at what time will they beep again?
(A) 4:00 pm (B) 4:30 pm (C) 5:00 pm (D) 5:30 pm
- 2) In the given figure, the graph of a polynomial $p(x)$ is shown. The number of zeroes of $p(x)$ is:

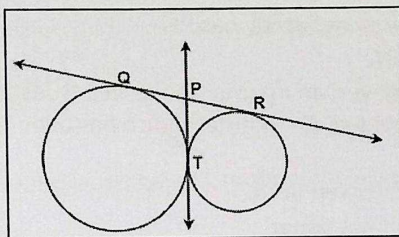


- (A) 1 (B) 2 (C) 3 (D) 4
- 3) If the system of linear equations $x + 3y = 4$ and $3x + ky + 12 = 0$ are inconsistent, the value of k is:
(A) $k = 12$ (B) $k = -12$ (C) $k = 9$ (D) $k = -9$
 - 4) Let p be a prime number. The quadratic equation having its roots as factors of p is:
(A) $x^2 - px + p = 0$ (B) $x^2 - (p + 1)x + p = 0$
(C) $x^2 + (p + 1)x + p = 0$ (D) $x^2 - px + p + 1 = 0$

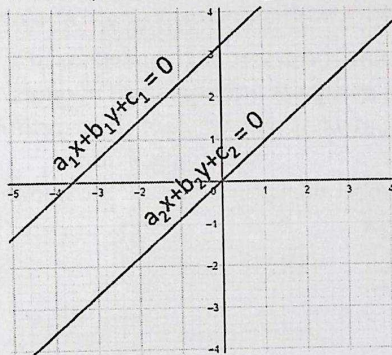
- 5) In the given figure, $DE \parallel BC$. If $AD = 3$ cm, $AB = 7$ cm and $EC = 3$ cm, then the length of AE is:



- (A) 2 cm (B) 2.25 cm (C) 3.5 cm (D) 4 cm
- 6) If $A(4, -2)$, $B(7, -2)$ and $C(7, 9)$ are the vertices of a $\triangle ABC$, then the $\triangle ABC$ is:
- (A) Equilateral triangle (B) Isosceles Triangle
(C) Right-angled Triangle (D) Isosceles Right-angled Triangle
- 7) In the given figure, QR is a common tangent to the given circles. Tangent at T meets QR at P . If $PQ = 5.5$ cm, then the length of QR is:



- (A) 8 cm (B) 10 cm (C) 11 cm (D) 7 cm
- 8) Which of the following statement(s) is/are true, related to the given pair of linear equations?



- (A) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (C) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (D) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
- 9) If two tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 80° , $\angle POA$ is equal to:
- (A) 80° (B) 70° (C) 60° (D) 50°

DIRECTION: In question number 10, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option.

- 10) **Assertion (A):** The equation $9x^2 + 3kx + 4 = 0$ has equal roots for $k = \pm 4$.

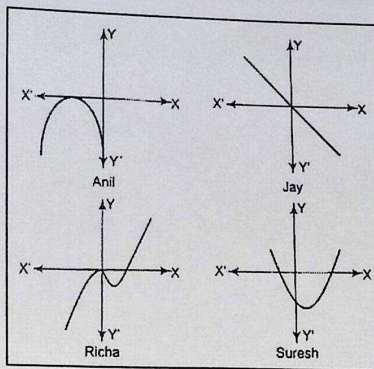
Reason (R): If discriminant ' D ' of a quadratic equation equals to zero, then the roots of quadratic equation are real and equal.

- (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 and 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

(Section B consists of 3 questions of 2 marks each.)

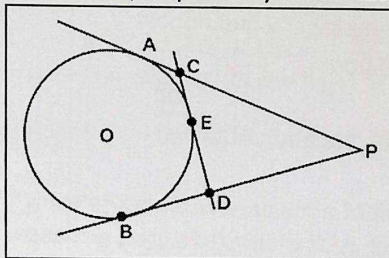
- 11) (a) In a classroom, four students Anil, Jay, Richa and Suresh were asked to draw the graph of $y = ax^2 + bx + c$. Answer the following questions based on the graphs drawn by the students as shown below.



- (i) How many students have drawn the graph correctly?
(ii) Which type of polynomial is represented by Jay's graph?

OR

- 11) (b) If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 4x + 3$, then find the value of $(\alpha^4\beta^2 + \alpha^2\beta^4)$.
12) Solve: $mx - ny = m^2 + n^2, x + y = 2m$
13) From an external point P, two tangents, PA and PB are drawn to a circle with centre O. At a point E on the circle, a tangent is drawn to intersect PA and PB at C and D, respectively. If PA = 10 cm, find the perimeter of $\triangle PCD$.



Section C

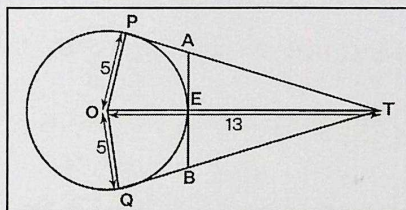
(Section C consists of 2 questions of 3 marks each)

- 14) Prove that $\sqrt{3}$ is an irrational number.
15) (a) The points A (4, 7), B (p, 3) and C (7, 3) are the vertices of a right triangle, right-angled at B. Find the value of p.
OR
15) (b) Points P, Q and R, in this order, divide a line segment joining A(6, 3) and B(10, 13) in four equal parts. Find the coordinates of P, Q and R.

Section D

(Section D consists of 2 questions of 5 marks each)

- 16) (a) Prove that the parallelogram circumscribing a circle is a rhombus.
OR
16) (b) In the given figure, O is the centre of a circle of radius 5 cm. T is a point such that OT = 13 cm and OT intersects circle at E. If AB is a tangent to the circle at E, find the length of AB, where TP and TQ are two tangents to the circle.



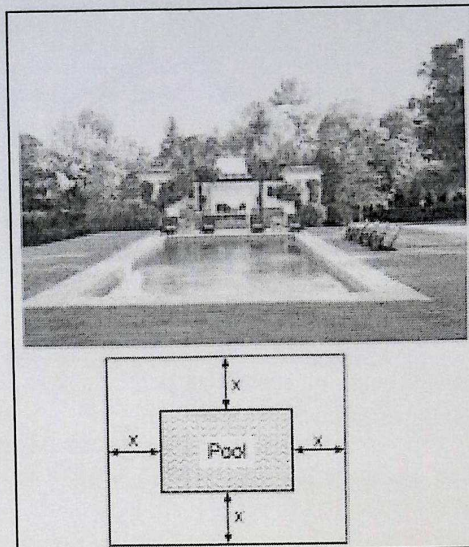
- 17) State and prove Basic Proportionality Theorem.

Section E

(Section E consists of 2 case studies of 4 marks each)

18) Case Study-1:

The Noida Authority decided to build a park to promote physical fitness and provide fresh air for the people. The park is a rectangular grassy area measuring 20 meters in length and 14 meters in breadth. At the center of the park lies a rectangular pool, surrounded on all sides by a uniform-width path. The area of this path is 120 square meters.



Based on this information, answer the following:

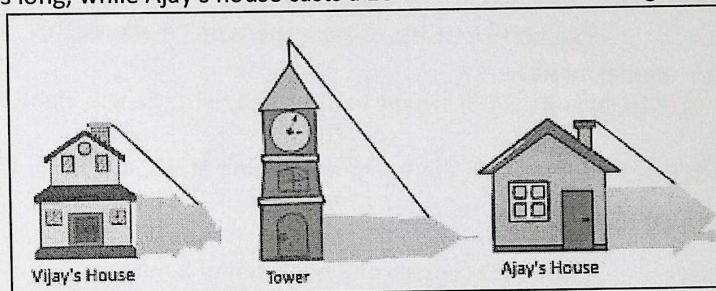
- If the width of the path is x meters, express the length and breadth of the pool in terms of x . [1]
- Form a quadratic equation using the given condition. [1]
- Find the actual dimensions of the pool. [2]

OR

- Find the nature of the roots of the equation obtained in question number (b). [2]

19) **Case Study-2:**

Vijay is trying to estimate the height of a tower near his house using the concept of similar triangles. At a particular time of the day, Vijay's house, which is 20 meters tall, casts a shadow 10 meters long. At the same time, the tower casts a shadow 50 meters long, while Ajay's house casts a 20-meter shadow on the ground.



Based on the above information, answer the following questions:

- Find the height of the tower. [1]
- What is the height of the Ajay's House? [1]
- When the tower casts a shadow of 40 m, at the same time find the length of the shadow of Ajay's house. [2]

OR

- When Vijay's house casts a shadow of 18 m, find the length of the shadow of the tower. [2]
