SECOND TERM SUMMATIVE ASSESSMENT 2026-27

MODEL QUESTION PAPER

MATHEMATICS

Std: X SET 2 **Score: 80**

Cool-off time: 15 minutes **Time: 2½ Hours**

Instructions

- Use the first 15 minutes to read the questions and think about the answers.
- There are 27 questions in 5 sections, A, B, C, D and E.
- Answer all questions. In questions of the type "A or B", answer only one.
- Explain your answers wherever necessary. Irrationals like $\sqrt{2}$, $\sqrt{3}$ need not be approximated unless asked.

Section A

This section has 8 questions of 1 score each. Choose the correct answer. **(8 × 1 = 8)**

1. What is the 10th term of the arithmetic sequence 7, 11, 15, ...? (1)

A. 43 B. 47 C. 40 D. 39

2. What are the coordinates of the midpoint of the line joining (2, 4) and (6, 8)? (1)

A. (8, 12) B. (4, 6) C. (2, 2) D. (3, 4)

3. What is the value of tan 45°? (1)

A. 0 B. 1/2 C. 1 D. $\sqrt{3}$

4. What is the angle between a tangent to a circle and the radius at the point of contact? (1)

A. 45° B. 60° C. 90° D. 180°

5. If 2 is a solution of $x^2 - kx + 8 = 0$, then k = (1)

A. 4 B. 6 C. −6 D. 8

6. If $x - 1$ is a factor of $x^2 + ax - 4$, then a = (1)

A. 3 B. −3 C. 4 D. 5

7. Read the statements. (1)

Statement I: The point (−3, 0) lies on the x-axis.

Statement II: The y-coordinate of every point on the x-axis is zero.

A) Statement I is true and statement II is false.

B) Statement I is false and statement II is true.

C) Both statements are true and statement II is the reason for statement I.

D) Both statements are true but statement II is not the reason for statement I.

8. Read the statements. (1)

Statement I: The length of the tangent from a point 5 cm away from the centre of a circle of radius 3 cm is 4 cm.

Statement II: A tangent to a circle is perpendicular to the radius at the point of contact.

A) Statement I is true and statement II is false.

B) Statement I is false and statement II is true.

C) Both statements are true and statement II is the reason for statement I.

D) Both statements are true but statement II is not the reason for statement I.

www.educationobserver.com

Section B

9. Cards numbered 1 to 20 are put in a box and one card is taken without looking. (3)
(i) What is the probability that it is a prime number?
(ii) What is the probability that it is a multiple of 3 or a multiple of 5?

10. Consider the arithmetic sequence 3, 7, 11, 15, ... (4)
(i) Write its algebraic form.
(ii) Write the sum of the first n terms in algebraic form.
(iii) How many terms from the beginning should be added to get 210?

Section C

11. A(−2, 3) and B(4, −5) are two points. (3)
(i) Find the distance between A and B.
(ii) Find the midpoint of AB.

12. Three vertices of a parallelogram ABCD are A(1, 2), B(5, 3) and C(7, 6). Find the coordinates of D. (3)

13. A. Prove that the points (1, 1), (4, 5) and (7, 9) are on a line. (4)

OR

B. Find the point on the x-axis which is at equal distances from A(2, 3) and B(6, 1).

14. A circle is drawn with the origin as centre and radius 10. (4)
(i) Write the coordinates of the points where it cuts the y-axis.
(ii) Is (6, 8) a point on the circle? Why?
(iii) Write the coordinates of two more points on the circle that are not on the axes.
(iv) Find the length of the chord joining (6, 8) and (−6, 8).

Section D

15. Solve $2x^2 - 7x + 3 = 0$. (3)

16. A. How many natural numbers starting from 1 must be added to get 120? (4)
(i) Form a second degree equation.
(ii) Solve it.

OR

B. The product of two consecutive odd numbers is 143.
(i) Form a second degree equation.
(ii) Find the numbers.

17. Consider $p(x) = 2x^3 - 5x^2 + x + 2$. (4)
(i) Find p(2).
(ii) Write p(x) as the product of x − 2 and a second degree polynomial.
(iii) Write p(x) as a product of first degree factors.

18. The two perpendicular sides of a right triangle differ by 2 cm, and its hypotenuse is 10 cm. (5)
(i) Form a second degree equation.
(ii) Find the perpendicular sides.
(iii) Find the area of the triangle.

www.educationobserver.com

Section E

19. A. Prove that the angle in a semicircle is a right angle. (3)

OR

B. In a cyclic quadrilateral ABCD, ∠A is three times ∠C. Find ∠A and ∠C.

20. Two chords AB and CD of a circle intersect at P. PA = 8 cm, PB = 3 cm and CD = 10 cm. Find PC and PD. (3)

21. A. The length of the tangent to a circle from a point P, 10 cm from the centre O, is 8 cm. (4)

(i) Find the radius of the circle.

(ii) Find the area of the triangle formed by O, P and the point of contact.

OR

B. A circle touches all four sides of a quadrilateral ABCD.

(i) Prove that AB + CD = AD + BC.

(ii) If AB = 6 cm, BC = 7 cm and CD = 8 cm, find AD.

22. A ladder 6 m long leans against a wall, making an angle of 60° with the ground. (4)

(i) How high up the wall does it reach?

(ii) How far is its foot from the wall?

23. A. A person on the ground sees the top of a tree at an angle of elevation of 30°. When he walks 20 m towards the tree, the angle becomes 60°. (4)

(i) Draw a rough figure.

(ii) Find the height of the tree. ($\sqrt{3} \approx 1.73$)

OR

B. The string of a kite is 100 m long and makes an angle of 30° with the ground.

(i) Draw a rough figure.

(ii) Find the height of the kite, assuming the string is straight.

24. A. PA and PB are tangents from P to a circle with centre O and radius 4 cm. ∠AOB = 120°. (5)

(i) Find ∠APB.

(ii) Find PA.

(iii) Find the perimeter and area of the quadrilateral OAPB.

OR

B. An equilateral triangle of side 12 cm is drawn with all its vertices on a circle.

(i) Find the radius of the circle.

(ii) Find the radius of the incircle of the triangle.

(iii) Find the area of the triangle.

25. Draw a circle of radius 3 cm. Draw two tangents to it that meet at an angle of 60°. (3)

26. Draw a triangle with sides 6 cm, 7 cm and 8 cm, and draw its incircle. (4)

27. (i) AB is a diameter of a circle and P is a point on AB. The perpendicular to AB at P meets the circle at C. If AP = 9 cm and PB = 4 cm, find PC. (5)

(ii) Draw a rectangle of length 5 cm and breadth 3 cm. Construct a square of the same area.

www.educationobserver.com