SECOND TERM SUMMATIVE ASSESSMENT 2026-27

ANSWER KEY / SCORING INDICATORS

MATHEMATICS

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

For teachers **Time: 2½ Hours**

Note to the teacher: Accept any correct method. Give scores for each correct step.

Section A

1. A. 43 ($7 + 9 \times 4$) (1)

2. B. (4, 6) (1)

3. C. 1 (1)

4. C. 90° (1)

5. B. 6 ($4 - 2k + 8 = 0$) (1)

6. A. 3 ($1 + a - 4 = 0$) (1)

7. C. Both statements are true and statement II is the reason for statement I. (1)

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Section B

9. (i) Primes: 2, 3, 5, 7, 11, 13, 17, 19 (8 numbers); probability = 8/20 = 2/5 (1)
(ii) Multiples of 3: 6; multiples of 5: 4; common (15): 1; total = 6 + 4 − 1 = 9; probability = 9/20 (2)

10. (i) $4n - 1$ (1)
(ii) Sum = $n/2 \times (3 + 4n - 1) = 2n^2 + n$ (1)
(iii) $2n^2 + n = 210 \Rightarrow 2n^2 + n - 210 = 0 \Rightarrow (n - 10)(2n + 21) = 0 \Rightarrow n = 10$ (2)

Section C

11. (i) AB = $\sqrt{(6^2 + 8^2)} = 10$ (2)
(ii) (1, −1) (1)

12. Diagonals bisect each other: midpoint of AC = (4, 4) = midpoint of BD. D = (8 − 5, 8 − 3) = (3, 5) (3)

13. A. Distances: between (1, 1) and (4, 5) = 5; between (4, 5) and (7, 9) = 5; between (1, 1) and (7, 9) = 10. Since 5 + 5 = 10, the points are on a line. (4)
B. Let the point be (x, 0). $(x - 2)^2 + 9 = (x - 6)^2 + 1 \Rightarrow -4x + 13 = -12x + 37 \Rightarrow 8x = 24 \Rightarrow x = 3$. The point is (3, 0). (4)

14. (i) (0, 10) and (0, −10) (1)
(ii) Yes; $\sqrt{(6^2 + 8^2)} = 10$ = radius (1)
(iii) Any two, e.g. (8, 6), (−6, 8), (6, −8) (1)
(iv) $6 - (-6) = 12$ (1)

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Section D

15. $2x^2 - 7x + 3 = (2x - 1)(x - 3) = 0$ (or by formula: $x = (7 \pm 5)/4$) (2)
$x = 3$ or $x = 1/2$ (1)

16. A. (i) $n(n + 1)/2 = 120 \Rightarrow n^2 + n - 240 = 0$ (2)
(ii) $(n + 16)(n - 15) = 0 \Rightarrow n = 15$ (2)
B. (i) $x(x + 2) = 143 \Rightarrow x^2 + 2x - 143 = 0$ (2)
(ii) $(x + 13)(x - 11) = 0 \Rightarrow 11$ and 13 (or -13 and -11) (2)

17. (i) $p(2) = 16 - 20 + 2 + 2 = 0$ (1)
(ii) $p(x) = (x - 2)(2x^2 - x - 1)$ (1)
(iii) $2x^2 - x - 1 = (2x + 1)(x - 1)$; $p(x) = (x - 2)(2x + 1)(x - 1)$ (2)

18. (i) $x^2 + (x + 2)^2 = 100 \Rightarrow x^2 + 2x - 48 = 0$ (2)
(ii) $(x + 8)(x - 6) = 0 \Rightarrow x = 6$; sides 6 cm and 8 cm (2)
(iii) Area = ½ × 6 × 8 = 24 cm² (1)

Section E

19. A. Correct proof: the angle at the centre made by the diameter is 180°; the angle on the circle is half of it, 90° (or using isosceles triangles). (3)
B. $\angle A + \angle C = 180°$; $3\angle C + \angle C = 180° \Rightarrow \angle C = 45°$, $\angle A = 135°$ (3)

20. PC × PD = PA × PB = 24, PC + PD = 10. $x(10 - x) = 24 \Rightarrow x^2 - 10x + 24 = 0 \Rightarrow x = 4$ or 6. PC = 4 cm, PD = 6 cm (or the other way). (3)

21. A. (i) $r = \sqrt{(10^2 - 8^2)} = 6$ cm (2)
(ii) Area = ½ × 6 × 8 = 24 cm² (2)
B. (i) Tangents from an external point are equal. If the tangent lengths from A, B, C, D are a, b, c, d, then AB + CD = (a + b) + (c + d) and AD + BC = (a + d) + (b + c); they are equal. (2)
(ii) AD = AB + CD − BC = 6 + 8 − 7 = 7 cm (2)

22. (i) Height = 6 sin 60° = $3\sqrt{3}$ m (≈ 5.2 m) (2)
(ii) Distance = 6 cos 60° = 3 m (2)

23. A. (i) Rough figure (1)
(ii) Let height be h and the second distance d. $h = d \tan 60° = \sqrt{3}\, d$; $h = (d + 20) \tan 30° = (d + 20)/\sqrt{3}$. So $3d = d + 20$, $d = 10$ m; $h = 10\sqrt{3} \approx 17.3$ m (3)
B. (i) Rough figure (1)
(ii) Height = 100 sin 30° = 50 m (3)

24. A. (i) $\angle APB = 180° - 120° = 60°$ (1)
(ii) $\angle APO = 30°$; $PA = 4/\tan 30° = 4\sqrt{3}$ cm (1)
(iii) Perimeter = $4 + 4 + 4\sqrt{3} + 4\sqrt{3} = 8 + 8\sqrt{3}$ cm; area = $2 \times ½ \times 4 \times 4\sqrt{3} = 16\sqrt{3}$ cm² (3)
B. (i) Circumradius = side/$\sqrt{3}$ = $12/\sqrt{3} = 4\sqrt{3}$ cm (2)
(ii) Inradius = half the circumradius = $2\sqrt{3}$ cm (1)
(iii) Area = $(\sqrt{3}/4) \times 12^2 = 36\sqrt{3}$ cm² (2)

25. Circle of radius 3 cm; two radii at an angle of 120° (1)
Tangents drawn perpendicular to the radii at their ends (1)
Tangents meet at 60° (1)

26. Triangle with sides 6, 7, 8 cm (1)
Bisectors of two angles; incentre (2)
Incircle (radius ≈ 1.9 cm) (1)

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27. (i) $PC^2 = PA \times PB = 36 \Rightarrow PC = 6$ cm (2)

(ii) Rectangle 5 cm × 3 cm; extend the length by 3 cm, semicircle on the 8 cm line, perpendicular at the joining point ($\sqrt{15}$ cm), and square on it. (3)

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