Kerala Plus Two Maths Unofficial Answer Key 2026

Mathematics (Science) - March 2026 Solutions

Examination: Second Year Higher Secondary

Max Scores: 60

Section I: 3-Score Questions (Answer any 6)

Questions 1 to 8 carry 3 scores each.

1. Matrix Algebra

Given matrices P, Q, and scalar matrix R.

- **(i) Order of PR:** P is 2×3 and R is 3×3. The order is 2 × 3.
- **(ii) Show PR = 3P:** Since R is a scalar matrix 3I, PR = P(3I) = 3(PI) = 3P.
- **(iii) 3P + Q:** [13, -5, 7; -11, 6, 13].

2. Relations

Set A = {1, 2, 3, 4} with Relation R = {(x, y) : x = y}.

- **(i) Equivalence:** R is Reflexive (a=a), Symmetric (a=b ⇒ b=a), and Transitive (a=b, b=c ⇒ a=c).
- **(ii) Equivalence Classes:** {1}, {2}, {3}, {4}.

3. Integration and Area

- **(i) ∫ sin x dx (0 to 1):** [-cos x] from 0 to 1 = 1 - cos(1).
- **(ii) Area of y = sin x (0 to 2π):** Sum of absolute areas = 2 + 2 = 4 sq. units.

4. Vectors

Points P(3, -1, 2) and Q(3, 6, 4).

- **(i) Vector PQ:** 0i + 7j + 2k.
- **(ii) Perpendicular Vector:** (b) i (since dot product with PQ is zero).
- **(iii) Angle:** cos θ = 28 / (5√53). θ = $\cos^{-1}$(28 / 5√53).

5. Inverse Trigonometry

- **(i) Principal Value:** $\cos^{-1}(-1/2) = 2\pi/3$.
- **(ii) Simple Form:** $\tan^{-1}(\cos x / (1 - \sin x)) = \pi/4 + x/2$.

6. Calculus: Continuity & Derivatives

- **(i) Derivative:** For y = √sin(2x+1), dy/dx = cos(2x+1) / √sin(2x+1).
- **(ii) Continuity at x=2:** LHL = 4, RHL = 4. However, f(2) is not defined. Result: Discontinuous.

7. Functions

f(x) on Natural numbers N.

- **One-one:** No, f(2)=2 and f(3)=2.
- **Onto:** Yes, Range = Codomain (N).

8. Probability

A: Head (1/2), B: 3 on die (1/6).

P(A∩B) = 1/12. Since P(A)P(B) = 1/12, they are Independent.

Section II: 4-Score Questions (Answer any 6)

Questions 9 to 16 carry 4 scores each.

9. Matrix Cofactors

- **(i) Cofactors C_{31}, C_{32}, C_{33}:** -1, 2, 8.
- **(ii) Sum Value:** Equal to the determinant |A|.

10. Partial Fractions

$\int (3x+1)/[(x-1)(x^2+1)]\, dx = 2\ln|x-1| - \ln|x^2+1| + \tan^{-1}x + C$.

11. Application of Derivatives (Graph)

- **(a) Decreasing Interval:** Where f'(x) is negative: (1, 5).
- **(b) Critical Points:** Max at x=1, Min at x=5.
- **(ii) Abs Max/Min:** g(x)=|x|+2 on [-2, 4]. Max = 6, Min = 2.

16. Total Probability

P(On Time) = P(Strike)P(OnTime|Strike) + P(NoStrike)P(OnTime|NoStrike).

P = (0.65 × 0.32) + (0.35 × 0.80) = 0.488.

Section III: 6-Score Questions (Answer any 3)

Questions 17 to 20 carry 6 scores each.

17. Matrix Method

System of linear equations.

Using $X = A^{-1}B$, the solutions are x=1, y=3, z=4.

19. Linear Programming

Maximize Z = 2x + 3y.

- **Corner Points:** (0,0), (8,0), (0,5), (6,2).
- **Max Value:** 18 at point (6, 2).

20. Differential Equations

- **(i) Solve dy/dx = xy:** y = Ae^(x²/2).
- **(ii) Curve through (1, 2):** Slope = x/y². Integrated: $2y^3 - 3x^2 = 13$.