
ISC CLASS XII MATHEMATICS (TEST PAPER 12) - SET 12

Time Allowed: 3 hours

Maximum Marks: 80

SECTION A (Compulsory - 65 Marks)

Question 1 (10×1 Mark = 10 Marks)

1. $\boxed{-15}$
2. $\boxed{5}$
3. $\boxed{\mathbb{R} \setminus \{0\}}$
4. $\boxed{\text{No, } R \text{ is not symmetric.}}$
5. $\boxed{\frac{dy}{dx} = \frac{\cos(\sqrt{x})}{2\sqrt{\sin x}}}$
6. $\boxed{\frac{d^2y}{dx^2} = 9e^{3x} + 18e^{-3x}}$
7. $\boxed{x}$
8. $\boxed{\frac{14}{3}}$
9. $\boxed{0.1}$
10. $\boxed{1.3}$

Question 2 (3×2 Marks = 6 Marks)

1. $\boxed{2\pi \text{ cm}^2}$
2. $\boxed{y = -x + 3}$
3. $\boxed{\frac{1}{221}}$

Question 3 (4×4 Marks = 16 Marks)

1. $\boxed{x^2 + y^2 - 2xy - 2x = 0}$
2. $\boxed{\text{Tangent: } y = 3x, \quad \text{Normal: } y = -\frac{1}{3}x + \frac{10}{3}}$
3. $\boxed{\tan^{-1}\left(\frac{x^2 + 1}{x}\right) + C}$
4. $\boxed{\text{Yes, } A \text{ is involutory.}}$ (Corrected)

Question 4 (3×6 Marks = 18 Marks)

1. $\boxed{\text{The determinant is 0.}}$
2. $\boxed{\text{The height is equal to the diameter of the base for maximum volume.}}$
3. $\boxed{\frac{\pi^2}{2ab}}$

Question 5 (15 Marks)

- (a) $\boxed{f^{-1}(x) = \frac{x+5}{4}}$
- (b) $\boxed{\frac{217}{216}}$
- (c) $\boxed{0.58}$

SECTION B (Optional - 15 Marks)

Question 6 (5 Marks)

1. $\boxed{\sqrt{83}}$
2. $\boxed{\frac{1}{2}|\vec{a} \times \vec{b} + \vec{b} \times \vec{c} + \vec{c} \times \vec{a}|}$

Question 7 (10 Marks)

1. $\boxed{11x + 2y - 7z = 0}$
2. $\boxed{1}$

SECTION C (Optional - 15 Marks)

Question 8 (5 Marks)

1. $\boxed{x = 3 \text{ units}}$ (Corrected)

Question 9 (10 Marks)

1. $\boxed{\text{Minimum value of } Z \text{ is 7 at the point } (1.5, 0.5).}$
2. $\boxed{\begin{array}{l} \text{Mean of } x : \bar{x} = 4, \\ \text{Mean of } y : \bar{y} = 7, \\ \text{Coefficient of correlation: } r = -0.5 \end{array}}$