
ISC CLASS XII MATHEMATICS (TEST PAPER 10) - SET 10

Time Allowed: 3 hours

Maximum Marks: 80

SECTION A (Compulsory - 65 Marks)

Question 1 (10×1 Mark = 10 Marks)

1. $\boxed{1}$

2. $\boxed{\frac{\pi}{3}}$

3. $\boxed{\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]}$

4. $\boxed{\text{Yes, } f(x) = 2x + 5 \text{ is one-one.}}$

5. $\boxed{\frac{dy}{dx} = \frac{\cos(\sqrt{x})}{2\sqrt{x}}}$

6. $\boxed{y = x^4 + C}$

7. $\boxed{k = 0}$

8. $\boxed{\frac{1}{3} \sin^{-1}\left(\frac{3x}{2}\right) + C}$

9. $\boxed{0.4}$

10. $\boxed{\text{Variance of } B(n, p) \text{ is } np(1 - p).}$

Question 2 (3×2 Marks = 6 Marks)

1. $\boxed{-\frac{4x}{(1+x^2)^2}}$

2. $\boxed{16 \text{ cm}^3/\text{s}}$

3. $\boxed{\frac{7}{15}}$

Question 3 (4×4 Marks = 16 Marks)

1. $\boxed{C_{21} = -7, \quad C_{33} = -5, \quad |A| = -21}$

2. $\boxed{x \tan x - \ln |\sec x| + C}$

3. $\boxed{(-1, -9)}$

4. $\boxed{y^2 = Cx - x^2}$

Question 4 (3×6 Marks = 18 Marks)

1. $\frac{1}{\sqrt{2}} \tan^{-1} \left(\frac{\tan 2x}{\sqrt{2}} \right) + C$
2. The area of a trapezoid with non-parallel sides equal is maximum when it is an equilateral trapezoid.
3. $(a-b)(b-c)(c-a)(a+b+c)^2$

Question 5 (15 Marks)

- (a) The relation R is an equivalence relation.
- (b) $E(X) = 2.1, \quad \text{Var}(X) = 1.29$
- (c) The events A and B are independent if and only if A and B' are independent. (Corrected)

SECTION B (Optional - 15 Marks)

Question 6 (5 Marks)

1. 4
2. $\frac{1}{3}(2\hat{i} - 2\hat{j} - \hat{k})$

Question 7 (10 Marks)

1. $\frac{3}{\sqrt{19}}$
2. $\frac{9}{2}$

SECTION C (Optional - 15 Marks)

Question 8 (5 Marks)

1. $x = 11.25$

Question 9 (10 Marks)

1. Minimum value of Z is 6 at the points $(0, 3)$ and $(6, 0)$.
2. Regression equation of y on $x : y = 1.33x + 6.67$,
Estimated value of y when $x = 13$ is 24.