CBSE Class 12 Mathematics

(SET–8) Answers key

Section A – MCQ Answers

1. 40
2. $2xe^{x^2}$
3. 2,3
4. 0°
5. 5/2
6. 0.65
7. 1/2
8. $A^T = -A$
9. 13
10. 40
11. sec x tan x
12. $\tan^{-1} x + C$
13. $P(A \cup B) = P(A) + P(B)$
14. 5
15. 8
16. ±1
17. $x^6 + C$
18. 0
19. $e - 1$
20. 5

Section B

21. Inverse

$$| A |= (1 \times 5 - 3 \times 2) = 5 - 6 = -1$$
$$A^{-1} = \begin{bmatrix} -5 & 3 \\ 2 & -1 \end{bmatrix}$$

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22. Differentiation

$$y = \tan^{-1} x$$
$$\frac{dy}{dx} = \frac{1}{1 + x^2}$$

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23. Normal Equation

$$y = x^2$$
$$dy/dx = 2x$$

At x=1 → slope = 2

Normal slope = −1/2

Point (1,1)

$$y - 1 = -\frac{1}{2}(x - 1)$$

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24. Integration

$$\int (5x^4 - 3x^2)dx$$
$$= x^5 - x^3 + C$$

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25. Unit Vector

Vector = (2,2,1)

Magnitude:

$$= \sqrt{4 + 4 + 1} = 3$$

Unit vector:

$$\frac{2}{3}i + \frac{2}{3}j + \frac{1}{3}k$$

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26. Probability (Black King)

Black kings = 2

$$P = 2/52 = 1/26$$

Section C

27. Solution

x = 2
y = 1
z = 3

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28. Differentiation

$$x^2 + xy + y^2 = 9$$
$$2x + x\frac{dy}{dx} + y + 2y\frac{dy}{dx} = 0$$
$$\frac{dy}{dx} = -\frac{2x + y}{x + 2y}$$

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29. Definite Integral

$$\int_0^2 x\, e^x dx$$

By parts:

$$= e^x(x - 1)\ |_0^2$$
$$= e^2 - 1$$

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30. Collinear

(2,4,6)=2(1,2,3)
(4,8,12)=4(1,2,3)

Hence collinear.

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31. Exactly One 5 (3 throws)

$$= 3C1(1/6)(5/6)^2$$
$$= 75/216$$

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32. Differential Equation

$$dy/dx + 3y = 0$$
$$y = Ce^{-3x}$$

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33. Area

$$4x - x^2 = 0$$

x=0,4

$$\int_0^4 (4x - x^2)dx$$
$$= \frac{32}{3}$$

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34. Sphere Equation

Centre (1,2,2), passes through origin

Radius^2 = 1+4+4 = 9

$$(x-1)^2 + (y-2)^2 + (z-2)^2 = 9$$

Section D

35. Determinant

$$| A | = 4$$

$$adj(A) = \begin{bmatrix} 3 & -1 & -1 \\ -1 & 3 & -1 \\ -1 & -1 & 3 \end{bmatrix}$$

$$A^{-1} = \frac{1}{4} adj(A)$$

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36. Lagrange MVT

$$\frac{f(2) - f(1)}{1} = 8 - 1 = 7$$

f'(x)=3x^2

$3c^2=7$

$$c = \sqrt{\frac{7}{3}}$$

Condition satisfied.

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37. Integration by Parts

$$\int x^2 e^x dx$$
$$= e^x(x^2 - 2x + 2) + C$$

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38. Shortest Distance

Using formula:

$$SD = \frac{| (a_2 - a_1) \cdot (b_1 \times b_2) |}{| b_1 \times b_2 |}$$

(Final value after solving = 2)

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39. Binomial (n=7, p=1/2)

Mean:

$$np = 7/2$$

Variance:

$$npq = 7/4$$

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40. Differential Equation

$$\frac{dy}{dx} - 2y = e^{2x}$$

IF = e^{-2x}

$$y = Ce^{2x} + xe^{2x}$$