CBSE Class 12 Mathematics

(SET–7) Answers key

Section A – MCQ Answers

1. 1
2. 4
3. 3
4. $a \times b = 0$
5. $8/3$
6. 0.8
7. 5
8. $A^{-1} = A^T$
9. 3
10. 11
11. $\frac{1}{1+x^2}$
12. $-e^{-x} + C$
13. $P(A \cap B) = P(A)P(B)$
14. 4
15. 1
16. $|A| = 0$
17. $x^2/2 + C$
18. 1
19. 1/4
20. 0

Section B

21. Determinant

$$| A |= (1 \times 5 - 2 \times 3)$$
$$= 5 - 6 = -1$$

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22. Differentiation

$$y = x^2 \ln\ x$$
$$\frac{dy}{dx} = 2x \ln\ x + x$$

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23. Tangent Equation

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

At x=1 → slope=2

Point (1,1)

$$y - 1 = 2(x - 1)$$

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24. Integration

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

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25. Magnitude

$$| a |= \sqrt{4 + 9 + 36}$$
$$= \sqrt{49} = 7$$

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26. Probability (Doublet)

Doublet outcomes = 6

Total outcomes = 36

$$P = 6/36 = 1/6$$

Section C

27. Solution

x = 1

y = 2

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28. Differentiation

$$x^2 + y^2 = 25$$
$$2x + 2y\frac{dy}{dx} = 0$$
$$\frac{dy}{dx} = -\frac{x}{y}$$

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29. Definite Integral

$$\int_0^1 (x+2)dx$$
$$= \left[\frac{x^2}{2} + 2x\right]_0^1$$
$$= \frac{1}{2} + 2 = \frac{5}{2}$$

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30. Parallel

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

Hence parallel.

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31. Exactly Three Heads (4 Tosses)

$$= 4C3(1/2)^4$$
$$= 4/16 = 1/4$$

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32. Differential Equation

$$dy/dx = 4x^3$$
$$y = x^4 + C$$

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33. Area

$$\int_0^3 x^2\,dx$$
$$= 27/3 = 9$$

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34. Plane Equation

Parallel plane → normal (1,1,1)

$$x - 1 + y + z = 0$$
$$x + y + z = 1$$

Section D

35. Determinant

Row 2 = 2×Row 1

$$|\,A\,| = 0$$

Matrix is singular → Not invertible.

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36. Rolle's Theorem

f(-√3)=0
f(√3)=0

$$f'(x) = 3x^2 - 3$$
$$3c^2 - 3 = 0$$
$$c = \pm 1$$

Condition satisfied.

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37. Integration by Parts

$$\int xe^x dx$$
$$= e^x(x-1) + C$$

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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 = 1)

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39. Binomial (n=6, p=1/3)

Mean:

$$np = 2$$

Variance:

$$npq = 6 \times \frac{1}{3} \times \frac{2}{3}$$
$$= 4/3$$

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40. Differential Equation

$$\frac{dy}{dx} + y = x$$

IF = e^x

Solution:

$$y = Ce^{-x} + x - 1$$