CBSE Class 12 Mathematics

(SET–10) Answers key

Section A – MCQ Answers

1. 128
2. 9
3. 2,2
4. 90°
5. 4
6. 0.6
7. 4
8. $A^T = A$
9. 5
10. 13
11. $1/x$
12. $e^{3x}/3 + C$
13. $P(A \cap B) = 0$
14. 1
15. 1
16. $|A| \neq 0$
17. $x^2 + C$
18. 0
19. $e - 1$
20. 3

Section B

21. Determinant

$$| A |= (1 \times 5 - 2 \times 4)$$
$$= 5 - 8 = -3$$

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22. Differentiation

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

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23. Tangent Equation

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

At x=2 → slope = 4

Point (2,4)

$$y - 4 = 4(x - 2)$$

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24. Integration

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

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25. Unit Vector

Vector = (3,4)

Magnitude:

$$= 5$$

Unit vector:

$$\frac{3}{5}i + \frac{4}{5}j$$

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26. Probability (Heart)

Hearts = 13

$$P = 13/52 = 1/4$$

Section C

27. Solution

x = 5

y = 1

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28. Differentiation

$$x^2 + y^2 = 13$$
$$2x + 2y\frac{dy}{dx} = 0$$
$$\frac{dy}{dx} = -\frac{x}{y}$$

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29. Definite Integral

$$\int_0^2 (x^2 + 3)dx$$
$$= \frac{8}{3} + 6$$
$$= \frac{26}{3}$$

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30. Parallel

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

Hence parallel.

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31. Probability (Sum 8)

Favourable outcomes = 5

$$P = 5/36$$

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32. Differential Equation

$$dy/dx = 6x^2$$
$$y = 2x^3 + C$$

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33. Area

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

x=0,4

$$\int_0^4 (4x - x^2)dx$$
$$= 32/3$$

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34. Sphere Equation

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

Section D

35. Determinant

$$| A | = 4$$
$$A^{-1} = \frac{1}{4}\begin{bmatrix} 3 & -1 & -1 \\ -1 & 3 & -1 \\ -1 & -1 & 3 \end{bmatrix}$$

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36. Lagrange MVT

$$\frac{f(3) - f(1)}{2} = \frac{9-1}{2} = 4$$

f'(x)=2x

2c=4

c=2

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 = 2)

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39. Binomial (n=5, p=1/2)

Mean:

$$np = 5/2$$

Variance:

$$npq = 5/4$$

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40. Differential Equation

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

IF = e^x

$$y = Ce^{-x} + \frac{e^x}{2}$$