

Rajasthan Board Class 12, 2026 Mathematics Question Paper

Time Allowed :3 Hours

Maximum Marks :100

Total questions :24

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The paper is divided into Section A and Section B.
2. Section A includes objective-type, short answer, and long answer questions.
3. All questions in Section A are compulsory.
4. Section B contains elective questions based on the chosen topic.
5. Answers must be written legibly within the word limit.
6. Use of unfair means or electronic devices is prohibited.
7. Follow the correct format and instructions for each section.

1. If $f : \mathbb{R} \rightarrow \mathbb{R}$ be given by $f(x) = (3 - x^3)^{\frac{1}{3}}$, then $f(f(x))$ is equal to

- (A) $x^{\frac{1}{3}}$
- (B) x^3
- (C) x
- (D) $(3 - x^3)$

2. The principal value of $\sin^{-1} \left(\frac{1}{\sqrt{2}} \right)$ is

- (A) $\frac{\pi}{4}$
- (B) $\frac{\pi}{6}$
- (C) $\frac{\pi}{3}$
- (D) $\frac{\pi}{2}$

3. $A = [a]_{m \times n}$ is a square matrix, if

- (A) $m < n$
 - (B) $m > n$
 - (C) $m = n$
 - (D) None of these
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4. $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -1 & 3 \\ -1 & 0 & 2 \end{bmatrix}$, then the $(2A - B)$ will be

- (A) $\begin{bmatrix} -1 & 5 & 3 \\ 5 & 6 & 0 \end{bmatrix}$
 - (B) $\begin{bmatrix} 5 & -1 & 3 \\ 5 & 6 & 0 \end{bmatrix}$
 - (C) $\begin{bmatrix} 2 & 4 & 6 \\ 4 & 6 & 2 \end{bmatrix}$
 - (D) $\begin{bmatrix} -3 & 1 & -3 \end{bmatrix}$
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5. Value of $\begin{vmatrix} x^2 - x + 1 & x - 1 \\ x + 1 & x + 1 \end{vmatrix}$ will be

- (A) $x^2 - x + 2$
 - (B) $x^3 + x^2 - 2$
 - (C) $x^3 - x^2 + 2$
 - (D) $x^3 + x^2 + 4$
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6. If $2x + 3y = \sin y$, then $\frac{dy}{dx}$ is equal to

- (A) $\frac{3}{\sin y - 2}$
- (B) $\frac{2}{\cos y - 3}$
- (C) $\frac{\cos y + 3}{2}$

(D) $\frac{2}{\cos y}$

7. $y = \cos^{-1} \left(\frac{1-x^2}{1+x^2} \right)$, $0 < x < 1$, then $\frac{dy}{dx}$ is equal to

(A) $\frac{1}{1+x^2}$

(B) $\frac{2}{4+x}$

(C) $\frac{2}{1+x^2}$

(D) $\frac{2}{x+x^2}$

8. The rate of change of the area of a circle with respect to its radius r at $r = 5$ cm is

(A) 12π

(B) 8π

(C) 5π

(D) 10π

9. $\int \frac{dx}{\sin^2 x \cos^2 x}$ equals

(A) $\tan x + \sin x + c$

(B) $\tan x - \cot x + c$

(C) $\tan x \cot x + c$

(D) $2 \tan x - \cot 2x + c$

10. Area of the region bounded by the curve $y^2 = 4x$, y -axis and the line $y = 3$ is

(A) 2

(B) $\frac{4}{9}$

(C) $\frac{9}{4}$

(D) $\frac{9}{2}$

11. The order of the differential equation $2x^2 \frac{d^2y}{dx^2} - 3 \frac{dy}{dx} + y = 0$ is

- (A) 2
 - (B) 1
 - (C) 0
 - (D) Not defined
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12. Which of the following is a vector quantity?

- (A) Time
 - (B) Volume
 - (C) Force
 - (D) Speed
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13. The sum of the vectors $a = i - 2j + k$, $b = -2i + 4j + 5k$ and $c = i - 6j - 7k$ is

- (A) $-4j - k$
 - (B) $4i - k$
 - (C) $4j + 5k$
 - (D) $i + 4j - k$
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14. The unit vector in the direction of the vector $\vec{a} = \hat{i} + \hat{j} + 2\hat{k}$ is

- (A) $\frac{\hat{i} + \hat{j} + 2\hat{k}}{\sqrt{5}}$
 - (B) $\frac{\hat{i} + \hat{j} + \hat{k}}{\sqrt{6}}$
 - (C) $\frac{2\hat{i} + \hat{j} + \hat{k}}{\sqrt{6}}$
 - (D) $\frac{\hat{i} + \hat{j} + 2\hat{k}}{\sqrt{6}}$
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15. If the straight lines $\frac{x+1}{1} = \frac{y+2}{\lambda} = \frac{z-1}{-1}$ and $\frac{x-1}{-\lambda} = \frac{y+1}{2} = \frac{z+1}{1}$ are perpendicular to each other, then the value of "λ" is

- (A) 0
- (B) 1

(C) 2

(D) 3

16. Two cards are drawn at random without replacement from a pack of 52 playing cards, then the probability that both the cards are black in color is:

(A) $\frac{1}{2}$

(B) $\frac{1}{12}$

(C) $\frac{25}{102}$

(D) $\frac{1}{4}$

17. If a pair of dice is thrown, then the probability of getting an even prime number on each die will be

(A) $\frac{1}{3}$

(B) $\frac{1}{12}$

(C) $\frac{1}{36}$

(D) 0

18. $\sin^{-1} x$ is a function whose domain is _____.

19. The value of determinant $\Delta = \begin{vmatrix} 1 & -2 & 4 \\ -1 & 3 & 0 \\ 4 & 1 & 0 \end{vmatrix}$ is -5.

20. The edge of a variable cube is increasing at the rate of 3 cm/s. The volume of the cube is increasing at the rate of _____ while the edge is 10 cm long.

21. $\int (2x - 3 \cos x + e^x) dx =$ _____.
