

JEE MAIN TRIGONOMETRIC FUNCTIONS — TRIGONOMETRIC EQUATIONS AND GENERAL SOLUTIONS — PYQS

Max. Marks: 40
Questions: 10

Section A (MCQ) — 8 questions

Q.1 Let $S = \{\theta \in (-2\pi, 2\pi) : \cos \theta + 1 = \sqrt{3} \sin \theta\}$.

Then $\sum_{\theta \in S} \theta$ is equal to :

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) $-\frac{2\pi}{3}$ (2) $-\frac{4\pi}{3}$ (3) $\frac{2\pi}{3}$ (4) $\frac{4\pi}{3}$

Scan or tap for the full solution



Q.2 Let $S = \{x \in [-\pi, \pi] : \sin x(\sin x + \cos x) = a, a \in \mathbb{Z}\}$.

Then $n(S)$ is equal to :

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 3 (2) 6 (3) 7 (4) 9

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Q.3 Number of solutions of $\sqrt{3} \cos 2\theta + 8 \cos \theta + 3\sqrt{3} = 0, \theta \in [-3\pi, 2\pi]$ is :

[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) 5 (2) 4 (3) 3 (4) 0

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Q.4 The number of solutions of the equation $\cos 2\theta \cos \frac{\theta}{2} + \cos \frac{5\theta}{2} = 2 \cos^3 \frac{5\theta}{2}$ in $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ is :

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) 5 (2) 7 (3) 6 (4) 9

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Q.5 The number of solutions of the equation $2x + 3 \tan x = \pi, x \in [-2\pi, 2\pi] - \left\{\pm \frac{\pi}{2}, \pm \frac{3\pi}{2}\right\}$ is :

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 4 (2) 5 (3) 3 (4) 6

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Q.6 If $\theta \in [-2\pi, 2\pi]$, then the number of solutions of $2\sqrt{2} \cos^2 \theta + (2 - \sqrt{6}) \cos \theta - \sqrt{3} = 0$, is equal to :

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) 8 (2) 6 (3) 10 (4) 12

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Q.7 The number of solutions of the equation

$$(4 - \sqrt{3}) \sin x - 2\sqrt{3} \cos^2 x = -\frac{4}{1 + \sqrt{3}}, x \in \left[-2\pi, \frac{5\pi}{2}\right] \text{ is}$$

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 4 (2) 3 (3) 6 (4) 5

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Q.8 If $\theta \in \left[-\frac{7\pi}{6}, \frac{4\pi}{3}\right]$, then the number of solutions of $\sqrt{3} \operatorname{cosec}^2 \theta - 2(\sqrt{3} - 1) \operatorname{cosec} \theta - 4 = 0$, is equal to :

[JEE Main 2025 (Online) 2nd April Evening Shift]

- (1) 7 (2) 10 (3) 6 (4) 8

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Section B (Numerical) — 2 questions

Q.9 If $S = \{\theta \in [-\pi, \pi] : \cos \theta \cos \frac{5\theta}{2} = \cos 7\theta \cos \frac{7\theta}{2}\}$, then $n(S)$ is equal to _____.

[JEE Main 2026 (Online) 5th April Evening Shift]

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Q.10 The number of elements in the set $\{x \in [0, 180^\circ] : \tan(x + 100^\circ) = \tan(x + 50^\circ) \tan x \tan(x - 50^\circ)\}$ is _____.

[JEE Main 2026 (Online) 24th January Evening Shift]

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ANSWER KEY

Section A (MCQ) — 8 questions

Ques.	1	2	3	4	5	6	7	8			
Ans.	2	4	1	2	2	1	4	3			

Section B (Numerical) — 2 questions

Ques.	9	10									
Ans.	19	4									