NCERT Solutions CBSE Free for Class 11th Maths Chapter 3 Trigonometric Functions | Updated 2026-27

⚡ Quick Revision Box — Class 11 Maths Chapter 3 Trigonometric Functions

- **Radian-Degree Relation:** 180° = π radians; to convert degrees → radians multiply by π/180
- **Arc Length Formula:** l = rθ where θ is in radians
- **ASTC Rule (Quadrant Signs):** Q1 — All positive; Q2 — Sin/Cosec positive; Q3 — Tan/Cot positive; Q4 — Cos/Sec positive
- **Pythagorean Identities:** $\sin^2 x + \cos^2 x = 1$, $1 + \tan^2 x = \sec^2 x$, $1 + \cot^2 x = \csc^2 x$
- **Sum Formula:** sin(A+B) = sin A cos B + cos A sin B
- **Periodicity:** sin and cos have period 2π; tan and cot have period π
- **Syllabus Note (2026-27):** Exercise 3.4 (Trigonometric Equations) is removed from CBSE rationalised syllabus

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The **NCERT Solutions CBSE free for Class 11th Maths Chapter 3 Trigonometric Functions** on this page cover every question from Exercises 3.1, 3.2, 3.3, and the Miscellaneous Exercise — fully updated for the **2026-27** academic year. Whether you need to convert angles between degrees and radians, find all six trigonometric values from one given value, or prove identities using sum and difference formulas, you will find clear step-by-step solutions here. This page is part of our complete NCERT Solutions for Class 11 series. You can also browse all subjects at NCERT Solutions. The official textbook is available on the NCERT official website.

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Chapter Overview — Class 11 Maths Chapter 3 Trigonometric Functions

Chapter 3 of the NCERT Class 11 Mathematics textbook extends trigonometry from right-triangle ratios (studied in Class 9–10) to the full real-number domain using the unit circle. You will learn to measure angles in radians, define all six trigonometric functions for any real number, and use compound-angle identities to evaluate and prove expressions.

This chapter carries significant weight in the CBSE board exam — questions from this chapter appear in 2-mark, 3-mark, and 5-mark sections. Proof-based questions from Exercise 3.3 are especially popular in board papers. Mastering this chapter also directly supports JEE Main preparation.

Detail	Information
Chapter	3 — Trigonometric Functions
Textbook	NCERT Mathematics Part I, Class 11
Class	11 (Grade 11)
Subject	Mathematics
Academic Year	2026-27
Exercises	3.1, 3.2, 3.3, Miscellaneous (Ex 3.4 removed from CBSE)
Prerequisites	Basic trigonometry (Class 10), coordinate geometry basics

Key Concepts and Theorems — Trigonometric Functions Class 11

Radian Measure and Angle Conversion

An angle is measured in radians when the arc length equals the radius. The fundamental relation is π radians = 180°. To convert degrees to radians, use $\theta_{rad} = \theta_{deg} \times \pi/180$. To convert radians to degrees, use $\theta_{deg} = \theta_{rad} \times 180/\pi$.

The arc length formula $l = r\theta$ (where θ is in radians) connects geometry to trigonometry and appears directly in Exercise 3.1.

Unit Circle Definition of Trigonometric Functions

For any real number x, if P(a, b) is the point on the unit circle corresponding to arc length x, then cos x = a and sin x = b. The other four functions are defined as reciprocals and ratios: tan x = (sin x)/(cos x), cot x = (cos x)/(sin x), sec x = (1)/(cos x), cosec x = (1)/(sin x).

Quadrant Sign Rule (ASTC)

The sign of each trigonometric function depends on the quadrant of the terminal ray. Remember **ASTC**: **A**ll positive (Q1), **S**in positive (Q2), **T**an positive (Q3), **C**os positive (Q4). This is the most frequently tested concept in Exercise 3.2.

Pythagorean Identities

Three fundamental identities follow directly from $\sin^2 x + \cos^2 x = 1$:

- $\sin^2 x + \cos^2 x = 1$
- $1 + \tan^2 x = \sec^2 x$
- $1 + \cot^2 x = \text{cosec}^2 x$

Sum and Difference Formulas

These are the backbone of Exercise 3.3 and Miscellaneous Exercise:

- sin(A ± B) = sin A cos B ± cos A sin B
- cos(A ± B) = cos A cos B mp sin A sin B
- tan(A ± B) = (tan A ± tan B)/(1 mp tan A tan B)

Formula Reference Table — Class 11 Maths Chapter 3

Formula Name	Formula	Variables
Degree to Radian	$\theta_r = \theta_d \times \pi/180$	θ_d = degrees, θ_r = radians
Arc Length	l = rθ	l = arc length, r = radius, θ = radians
Pythagorean Identity 1	$\sin^2 x + \cos^2 x = 1$	x = any real number
Pythagorean Identity 2	$1 + \tan^2 x = \sec^2 x$	$x \neq \pi/2 + n\pi$
Pythagorean Identity 3	$1 + \cot^2 x = \text{cosec}^2 x$	$x \neq n\pi$
sin(A+B)	sin A cos B + cos A sin B	A, B real numbers
sin(A−B)	sin A cos B - cos A sin B	A, B real numbers
cos(A+B)	cos A cos B - sin A sin B	A, B real numbers
cos(A−B)	cos A cos B + sin A sin B	A, B real numbers

Formula Name	Formula	Variables
tan(A+B)	(tan A + tan B)/(1 - tan A tan B)	tan A tan B ≠ 1
Sum-to-Product (sin)	sin A + sin B = 2sinA+B/2cosA-B/2	A, B real numbers
Product-to-Sum (cos)	cos A - cos B = -2sinA+B/2sinA-B/2	A, B real numbers

NCERT Solutions CBSE Free for Class 11th Maths Chapter 3 — All Exercises Step by Step

Below are complete, step-by-step solutions for all questions in Chapter 3. These solutions match the official NCERT answer key and are structured for maximum marks in your 2026-27 board exam. Each solution shows full working — never skip steps in your exam answer.

Exercise 3.1 — Angles and Radian Measure

Question 1

Easy

Find the radian measures corresponding to the following degree measures: (i) 25° (ii) −47°30′ (iii) 240° (iv) 520°

(i) 25°

Step 1: Use the conversion formula θ_rad = θ_deg × π/180

25° = 25 × π/180 = (25π)/(180) = (5π)/(36) radians

∴ 25° = (5π)/(36) radians

(ii) −47°30′

Step 1: Convert minutes to degrees. 30' = 30/60° = 1/2°

Step 2: So -47°30' = -471/2° = -95/2°

Step 3: Convert to radians:

-95/2 × π/180 = -(95π)/(360) = -(19π)/(72) radians

∴ −47°30′ = -(19π)/(72) radians

(iii) 240°

Step 1: Apply the conversion formula:

$$240 \times \pi/180 = (240\pi)/(180) = (4\pi)/(3) \text{ radians}$$

∴ 240° = (4π)/(3) radians

(iv) 520°

Step 1: Apply the conversion formula:

$$520 \times \pi/180 = (520\pi)/(180) = (26\pi)/(9) \text{ radians}$$

∴ 520° = (26π)/(9) radians

Board Exam Note: Degree-to-radian conversion appears in 2-3 mark sections. Always simplify the fraction fully.

Question 2

Easy

Find the degree measures corresponding to the following radian measures (use π = 22/7): (i) 11/16 (ii) -4 (iii) (5π)/(3) (iv) (7π)/(6)

(i) 11/16 radians

Step 1: Use $\theta\_deg = \theta\_rad \times 180/\pi$

$$11/16 \times 180/\pi = (11 \times 180)/(16\pi) = (11 \times 180 \times 7)/(16 \times 22) = (11 \times 45 \times 7)/(4 \times 22) = 315/8$$

Step 2: Convert 315/8 = 393/8° = 39° + (3 × 60)/(8)' = 39°22'30"

∴ 11/16 rad = 39°22′30″

(ii) −4 radians

Step 1: -4 × 180/π = (-720)/(π) = (-720 × 7)/(22) = (-5040)/(22) = -2291/11°

Step 2: 1/11° = 60/11' = 55/11'; 5/11' = 300/11" = 273/11"

∴ −4 rad = −229°5′27″ (approx)

(iii) (5π)/(3) radians

Step 1: (5π)/(3) × 180/π = (5 × 180)/(3) = 300°

∴ (5π)/(3) rad = 300°

(iv) (7π)/(6) radians

Step 1: (7π)/(6) × 180/π = (7 × 180)/(6) = 210°

∴ **(7π)/(6) rad = 210°**

Board Exam Note: When π is given as 22/7, substitute it directly. Do not leave π in the final answer for radian-to-degree conversions.

Question 3

Medium

A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?

Step 1: Revolutions per second = 360/60 = 6 revolutions/second.

Step 2: One complete revolution = 2π radians.

Step 3: Radians in 6 revolutions = 6 × 2π = 12π radians.

∴ **The wheel turns 12π radians in one second.**

Board Exam Note: This application-type question appears in 2-3 mark sections. State the unit (radians) clearly.

Question 4

Medium

Find the degree measure of the angle subtended at the centre of a circle of radius 100 cm by an arc of length 22 cm. (Use π = 22/7)

Step 1: Use θ = l/r, where l = 22 cm, r = 100 cm.

$$\theta = 22/100 = 11/50 \text{ radians}$$

Step 2: Convert to degrees: 11/50 × 180/π = (11 × 180 × 7)/(50 × 22) = (11 × 180 × 7)/(1100) = (1386)/(110) = 12.6°

Step 3: 12.6° = 12° + 0.6 × 60' = 12°36'

∴ **The angle is 12°36′.**

Board Exam Note: Always convert the final radian answer to degrees and minutes when the question asks for degree measure.

Question 5

Medium

In a circle of diameter 40 cm, the length of a chord is 20 cm. Find the length of the minor arc of the chord.

Step 1: Radius $r = 40/2 = 20$ cm. Chord AB = 20 cm.

Step 2: Since OA = OB = AB = 20 cm, triangle OAB is equilateral. So the central angle $\theta = 60° = \pi/3$ radians.

Step 3: Arc length = $r\theta = 20 \times \pi/3 = (20\pi)/(3)$ cm.

∴ Length of minor arc = $(20\pi)/(3)$ cm.

Board Exam Note: The key insight — recognising the equilateral triangle — must be stated explicitly in your board answer.

Question 6

Medium

If in two circles, arcs of the same length subtend angles 60° and 75° at the centre, find the ratio of their radii.

Step 1: Convert angles: $60° = \pi/3$ rad, $75° = (5\pi)/(12)$ rad.

Step 2: Since arc length l is the same: $l = r_1 \theta_1 = r_2 \theta_2$

$$r_1 \cdot \pi/3 = r_2 \cdot (5\pi)/(12)$$

Step 3: Solve for the ratio:

$$r_1/r_2 = (5\pi/12)/(\pi/3) = (5\pi)/(12) \times 3/\pi = 5/4$$

∴ $r_1 : r_2 = 5 : 4$

Board Exam Note: State the $l = r\theta$ formula before using it — examiners award method marks for this.

Question 7

Easy

Find the angle in radian through which a pendulum swings if its length is 75 cm and the tip describes an arc of length (i) 10 cm (ii) 15 cm (iii) 21 cm.

(i) $l = 10$ cm

$$\theta = l/r = 10/75 = 2/15 \text{ radians}$$

∴ $\theta = 2/15$ radians

(ii) $l = 15$ cm

$$\theta = 15/75 = 1/5 \text{ radians}$$

∴ $\theta = 1/5$ radians

(iii) $l = 21$ cm

$$\theta = 21/75 = 7/25 \text{ radians}$$

∴ $\theta = 7/25$ radians

Board Exam Note: This is a direct application of $\theta = l/r$. Write the formula first, then substitute.

Exercise 3.2 — Trigonometric Functions and Quadrants

Question 1

Medium

Find the values of other five trigonometric functions if cos x = -1/2, x lies in third quadrant.

Step 1: sec x = (1)/(cos x) = -2

Step 2: Use $\sin^2 x + \cos^2 x = 1$: $\sin^2 x = 1 - 1/4 = 3/4$, so sin x = ±(√(3))/(2).

Step 3: In Q3, sin is negative: sin x = -(√(3))/(2), cosec x = -(2)/(√(3)) = -(2√(3))/(3)

Step 4: tan x = (sin x)/(cos x) = (-√(3)/2)/(-1/2) = √(3), cot x = (1)/(√(3)) = (√(3))/(3)

∴ sin x = -(√(3))/(2),\ cosec x = -(2√(3))/(3),\ tan x = √(3),\ cot x = (√(3))/(3),\ sec x = -2

Board Exam Note: Always state the quadrant sign rule before assigning the sign — examiners check for this reasoning.

Question 2

Medium

Find the values of other five trigonometric functions if sin x = 3/5, x lies in second quadrant.

Step 1: cosec x = 5/3

Step 2: $\cos^2 x = 1 - 9/25 = 16/25$. In Q2, cos x = -4/5, sec x = -5/4

Step 3: tan x = (3/5)/(-4/5) = -3/4, cot x = -4/3

∴ cos x = -4/5,\ sec x = -5/4,\ tan x = -3/4,\ cot x = -4/3,\ cosec x = 5/3

Question 3

Medium

Find the values of other five trigonometric functions if cot x = 3/4, x lies in third quadrant.

Step 1: tan x = 4/3 (In Q3, tan is positive — consistent.)

Step 2: $\sec^2 x = 1 + \tan^2 x = 1 + 16/9 = 25/9$. In Q3, cos x < 0, so cos x = -3/5, sec x = -5/3.

Step 3: sin x = tan x · cos x = 4/3 × (-3/5) = -4/5, cosec x = -5/4

∴ sin x = -4/5,\ cos x = -3/5,\ tan x = 4/3,\ sec x = -5/3,\ cosec x = -5/4

Question 4

Medium

Find the values of other five trigonometric functions if sec x = 13/5, x lies in fourth quadrant.

Step 1: cos x = 5/13 (In Q4, cos is positive — consistent.)

Step 2: $\sin^2 x = 1 - 25/169 = 144/169$. In Q4, sin x = -12/13, cosec x = -13/12

Step 3: tan x = (-12/13)/(5/13) = -12/5, cot x = -5/12

∴ sin x = -12/13,\ cos x = 5/13,\ tan x = -12/5,\ cot x = -5/12,\ cosec x = -13/12

Question 5

Medium

Find the values of other five trigonometric functions if tan x = -5/12, x lies in second quadrant.

Step 1: cot x = -12/5

Step 2: $\sec^2 x = 1 + \tan^2 x = 1 + 25/144 = 169/144$. In Q2, $\cos x < 0$: $\cos x = -12/13$, $\sec x = -13/12$

Step 3: $\sin x = \tan x \cdot \cos x = (-5/12)(-12/13) = 5/13$, $\text{cosec}\, x = 13/5$

∴ sin x = 5/13,\ cos x = -12/13,\ cot x = -12/5,\ sec x = -13/12,\ cosec x = 13/5

Question 6

Easy

Find the value of the trigonometric function sin 765°.

Key Concept: sin has period 360°, so $\sin(\theta + 360°n) = \sin\theta$.

$$\sin 765° = \sin(2 \times 360° + 45°) = \sin 45° = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

∴ sin 765° = (√(2))/(2)

Question 7

Easy

Find the value of the trigonometric function cosec(-1410°).

Step 1: Add multiples of 360° to get a standard angle:

$$-1410° + 4 \times 360° = -1410° + 1440° = 30°$$

Step 2: $\text{cosec}(-1410°) = \text{cosec}\, 30° = 2$

∴ cosec(-1410°) = 2

Question 8

Easy

Find the value of the trigonometric function tan(19π)/(3).

Key Concept: tan has period π.

$$\tan\frac{19\pi}{3} = \tan(6\pi + \pi/3) = \tan\pi/3 = \sqrt{3}$$

∴ tan(19π)/(3) = √(3)

Question 9

Easy

Find the value of the trigonometric function $\sin(-(11\pi)/(3))$.

Step 1: Add $2 \times 2\pi = 4\pi$:

$$-(11\pi)/(3) + 4\pi = -(11\pi)/(3) + (12\pi)/(3) = \pi/3$$

$$\sin(-(11\pi)/(3)) = \sin\pi/3 = (\sqrt{(3)})/(2)$$

∴ $\sin(-(11\pi)/(3)) = (\sqrt{(3)})/(2)$

Question 10

Easy

Find the value of the trigonometric function $\cot(-(15\pi)/(4))$.

Step 1: cot has period π. Add 4π:

$$-(15\pi)/(4) + 4\pi = -(15\pi)/(4) + (16\pi)/(4) = \pi/4$$

$$\cot(-(15\pi)/(4)) = \cot\pi/4 = 1$$

∴ $\cot(-(15\pi)/(4)) = 1$

Board Exam Note: For periodicity questions, clearly write which period you are using (2π for sin/cos, π for tan/cot) before reducing the angle.

Exercise 3.3 — Sum and Difference Formulas (Proofs)

Question 1

Easy

Prove that: $\sin^2\pi/6 + \cos^2\pi/3 - \tan^2\pi/4 = -1/2$

Step 1: Substitute standard values: $\sin\pi/6 = 1/2,\ \cos\pi/3 = 1/2,\ \tan\pi/4 = 1$

$$LHS = (1/2)^2 + (1/2)^2 - (1)^2 = 1/4 + 1/4 - 1 = 1/2 - 1 = -1/2$$

∴ LHS = RHS = -1/2. Hence proved.

Question 4

Easy

Prove that: $2\sin^2(3\pi)/(4) + 2\cos^2\pi/4 + 2\sec^2\pi/3 = 10$

Step 1: $\sin(3\pi)/(4) = \sin(\pi - \pi/4) = \sin\pi/4 = (1)/(\sqrt{(2)})$

Step 2: $\cos\pi/4 = \frac{1}{\sqrt{2}}$, $\sec\pi/3 = 2$

$$LHS = 2\left(\frac{1}{\sqrt{2}}\right)^2 + 2\left(\frac{1}{\sqrt{2}}\right)^2 + 2(2)^2 = 2 \cdot 1/2 + 2 \cdot 1/2 + 8 = 1 + 1 + 8 = 10$$

∴ LHS = 10 = RHS. Hence proved.

Question 5

Medium

Find the value of: (i) sin 75° (ii) tan 15°

(i) sin 75°

Step 1: Write 75° = 45° + 30° and apply sin(A+B) formula:

$$\sin 75° = \sin 45° \cos 30° + \cos 45° \sin 30°$$

$$= \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \cdot 1/2 = \frac{\sqrt{3} + 1}{2\sqrt{2}} = \frac{\sqrt{6}+\sqrt{2}}{4}$$

∴ $\sin 75° = \frac{\sqrt{6}+\sqrt{2}}{4}$

(ii) tan 15°

Step 1: Write 15° = 45° - 30° and apply tan(A-B) formula:

$$\tan 15° = \frac{\tan 45° - \tan 30°}{1 + \tan 45° \tan 30°} = \frac{1 - \frac{1}{\sqrt{3}}}{1 + \frac{1}{\sqrt{3}}} = \frac{\sqrt{3}-1}{\sqrt{3}+1}$$

Step 2: Rationalise: $\frac{(\sqrt{3}-1)^2}{(\sqrt{3}+1)(\sqrt{3}-1)} = \frac{3 - 2\sqrt{3} + 1}{2} = 2 - \sqrt{3}$

∴ $\tan 15° = 2 - \sqrt{3}$

Board Exam Note: Questions on sin 75° and tan 15° appear frequently in board exams. Rationalising the denominator is expected in the final answer.

Question 8

Medium

Prove that: $\frac{\cos(\pi+x)\cos(-x)}{\sin(\pi-x)\cos(\pi/2+x)} = \cot^2 x$

Step 1: Apply allied angle identities: $\cos(\pi+x) = -\cos x$, $\cos(-x) = \cos x$, $\sin(\pi-x) = \sin x$, $\cos(\pi/2+x) = -\sin x$

$$LHS = \frac{(-\cos x)(\cos x)}{(\sin x)(-\sin x)} = \frac{-\cos^2 x}{-\sin^2 x} = \frac{\cos^2 x}{\sin^2 x} = \cot^2 x$$

∴ LHS = $\cot^2 x$ = RHS. Hence proved.

Question 12

Hard

Prove that: $\sin^2 6x - \sin^2 4x = \sin 2x \sin 10x$

Step 1: Use the identity $\sin^2 A - \sin^2 B = (\sin A + \sin B)(\sin A - \sin B)$:

$$\text{LHS} = (\sin 6x + \sin 4x)(\sin 6x - \sin 4x)$$

Step 2: Apply sum-to-product: $\sin 6x + \sin 4x = 2\sin 5x \cos x$ and $\sin 6x - \sin 4x = 2\cos 5x \sin x$

$$= (2\sin 5x \cos x)(2\cos 5x \sin x) = (2\sin 5x \cos 5x)(2\sin x \cos x) = \sin 10x \cdot \sin 2x$$

∴ **LHS = sin 2x sin 10x = RHS. Hence proved.**

Board Exam Note: Proof questions in long-answer sections require every step written out. Skipping the sum-to-product step costs marks.

Solved Examples Beyond NCERT — Trigonometric Functions Class 11

Extra Example 1

Medium

If $\sin A = 4/5$ and $\cos B = 5/13$, where A and B are in the first quadrant, find $\sin(A+B)$.

Step 1: Find cos A: cos A = √(1 - frac16)25 = 3/5

Step 2: Find sin B: sin B = √(1 - frac25)169 = 12/13

Step 3: Apply $\sin(A+B) = \sin A \cos B + \cos A \sin B$:

$$= 4/5 \cdot 5/13 + 3/5 \cdot 12/13 = 20/65 + 36/65 = 56/65$$

∴ **sin(A+B) = 56/65**

Extra Example 2

Hard

Prove that $\cos 20° \cos 40° \cos 80° = 1/8$.

Step 1: Multiply and divide by $2\sin 20°$:

= (2sin 20° cos 20°)/(2sin 20°) · cos 40° cos 80° = (sin 40°)/(2sin 20°) · cos 40° cos 80°

Step 2: Multiply and divide by 2 again: = (sin 80°)/(4sin 20°) · cos 80° = (sin 160°)/(8sin 20°)

Step 3: sin 160° = sin(180°-20°) = sin 20°, so the expression = (sin 20°)/(8sin 20°) = 1/8

∴ cos 20° cos 40° cos 80° = 1/8. Hence proved.

Topic-Wise Important Questions for Board Exam — Class 11 Maths Chapter 3

1-Mark Questions

- Convert 240° to radians. *Answer: (4π)/(3)*
- What is the period of tan x? *Answer: π*
- Find sin(-30°). *Answer: -1/2*

3-Mark Questions

- If cos x = -3/5 and x is in Q3, find all six trigonometric values.
- Prove: sin 2x + 2sin 4x + sin 6x = $4\cos^2 x$ sin 4x

5-Mark Questions

- Prove that $\cos^2 2x - \cos^2 6x$ = sin 4x sin 8x using sum-to-product identities. Show all steps clearly.

Common Mistakes Students Make — Class 11 Maths Chapter 3

Mistake 1: Forgetting to check the quadrant when finding sin x from cos x.
Why it's wrong: sin x = $\pm\sqrt{1-\cos^2 x}$ — both values are algebraically valid but only one is correct for the given quadrant.
Correct approach: Always state the quadrant rule (ASTC) before choosing the sign.

Mistake 2: Writing cos(A+B) = cos A + cos B.
Why it's wrong: The cosine of a sum is NOT the sum of cosines. This is one of the most common errors in Exercise 3.3.
Correct approach: Use cos(A+B) = cos A cos B - sin A sin B.

Mistake 3: Not converting angles to radians before using l = rθ.
Why it's wrong: The arc length formula requires θ in radians. Using degrees gives a wrong answer.
Correct approach: Always convert to radians first: $\theta_{rad} = \theta_{deg} \times \pi/180$.

Mistake 4: Confusing the period of sin/cos (which is 2π) with the period of tan/cot (which is π).
Correct approach: Memorise: sin, cos, sec, cosec → period 2π; tan, cot → period π.

Mistake 5: Leaving (√(3)-1)/(√(3)+1) without rationalising in the final answer.
Correct approach: Always rationalise surds in the denominator. The answer tan 15° = 2-√(3) is the expected form.

Exam Tips for 2026-27 — CBSE Class 11 Maths Chapter 3

CBSE 2026-27 Exam Strategy — Trigonometric Functions

- **Write the formula before substituting:** The 2026-27 CBSE marking scheme awards 1 mark for writing the correct formula, even if the calculation has a minor error.
- **Proof questions — always start from LHS:** Unless the question says otherwise, always start from the more complex side. Examiners deduct marks for starting from RHS without justification.
- **State the quadrant rule explicitly:** In Exercise 3.2-type questions, write "Since x lies in Q__, the sign of __ is __" before assigning signs. This earns method marks.
- **Radian measure questions are easy marks:** Exercise 3.1 questions are straightforward formula applications — practise these for guaranteed marks in the 2026-27 board exam.
- **Note on Ex 3.4:** Trigonometric Equations (Exercise 3.4) is removed from the CBSE 2026-27 rationalised syllabus. Do not spend time on it for board exam preparation.
- **Last-minute checklist:** (1) All standard values (sin/cos/tan of 0°, 30°, 45°, 60°, 90°) ✓ (2) ASTC rule ✓ (3) Sum-difference formulas ✓ (4) Sum-to-product formulas ✓ (5) Periodicity of all six functions ✓

For more solutions across all chapters, visit our complete NCERT Solutions for Class 11 hub, or explore all subjects at NCERT Solutions.

Frequently Asked Questions — Class 11 Maths Chapter 3 Trigonometric Functions

How do you convert degrees to radians in Class 11 Maths Chapter 3?

To convert degrees to radians, multiply the degree measure by π/180. For example, 180° = π radians and 60° = π/3 radians. This formula is used in all seven questions of Exercise 3.1. Remember: when the question gives π = 22/7, substitute that value directly to get a numerical answer.

How do you find all six trigonometric values given one value in Class 11?

Start with the given function and find its reciprocal. Then use the Pythagorean identity $\sin^2 x + \cos^2 x = 1$ to find the remaining functions. The key step is determining the correct sign using the ASTC quadrant rule. Finally, compute tan x = sin x / cos x and cot x = cos x / sin x. This method is tested in all five questions of Exercise 3.2.

Which exercises are in the current CBSE 2026-27 syllabus for Chapter 3?

The current CBSE 2026-27 rationalised syllabus includes Exercise 3.1 (angles and radian measure), Exercise 3.2 (trigonometric functions), Exercise 3.3 (sum and difference formulas), and the Miscellaneous Exercise. Exercise 3.4 on Trigonometric Equations has been removed from the CBSE syllabus. State board students may still need it — check your specific board's syllabus.

What is the arc length formula and how is it used in Exercise 3.1?

The arc length formula is $l = r\theta$, where l is the arc length, r is the radius, and θ is the central angle in radians. Rearranging gives $\theta = l/r$. In Exercise 3.1, this formula is used to find arc lengths (Q5), central angles (Q4, Q7), and ratios of radii (Q6). Always ensure θ is in radians before applying this formula.

How do you prove trigonometric identities in Exercise 3.3 Class 11?

Always start from the LHS (more complex side) and simplify step by step until you reach the RHS. Use the sum-difference formulas, allied angle identities, and sum-to-product formulas as needed. Write every formula you apply — examiners award marks for each correct step. Never manipulate both sides simultaneously in a proof question.
