NCERT Solutions for Class 10 Maths Chapter 8 Introduction to Trigonometry | Updated 2026-27

⚡ Quick Revision Box — Chapter 8 Trigonometry

- **Chapter:** 8 — Introduction to Trigonometry | Class 10 Maths NCERT
- **Six Trig Ratios:** sin, cos, tan, cosec, sec, cot — all defined from sides of a right triangle
- **Key Identity:** $\sin^2 A + \cos^2 A = 1$ for all values of A
- **Pythagoras Link:** Always find the missing side using Hypotenuse² = Base² + Perpendicular² before writing ratios
- **Range of sin and cos:** Always between 0 and 1 for acute angles (0° to 90°)
- **tan A range:** Can be any positive value — it is NOT always less than 1
- **Exercise 8.1:** 11 questions — all based on finding trig ratios from given conditions
- **Board Weightage:** Trigonometry unit carries ~12 marks in CBSE Class 10 board exam 2026-27

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The **NCERT Solutions for Class 10 Maths Chapter 8 Introduction to Trigonometry** on this page cover all 11 questions of Exercise 8.1 with complete step-by-step working, updated for the CBSE 2026-27 board exam. You can find all [NCERT Solutions for Class 10](#) on our sub-hub, and the full collection of [NCERT Solutions](#) for all classes on our main hub. This chapter introduces you to the six trigonometric ratios — sin, cos, tan, cosec, sec, and cot — and shows you how to calculate them from the sides of a right-angled triangle.

NCERT Solutions for Class 10 Maths Chapter 8 Introduction to Trigonometry — Chapter Overview

Chapter 8 of the NCERT Class 10 Maths textbook introduces trigonometry — the branch of mathematics that studies the relationship between the angles and sides of a right-angled triangle. This is one of the most important chapters for CBSE Class 10 because it forms the foundation for Chapter 9 (Some Applications of Trigonometry) and continues into Class 11 and 12 Maths.

For the CBSE 2026-27 board exam, the Trigonometry unit (Chapters 8 and 9 together) carries approximately **12 marks**. Questions from Exercise 8.1 typically appear as 1-mark MCQs (true/false type), 2-mark short answers (finding a ratio given another), and 3-mark problems (finding all ratios). You can download the official textbook from the [official NCERT website](#).

Before starting this chapter, make sure you are comfortable with the **Pythagoras theorem** (from Class 9 Chapter 7 — Triangles) and basic algebraic manipulation. Every solution in Exercise 8.1 uses Pythagoras to find the missing side before writing the trig ratios.

Detail	Information
Chapter	8 — Introduction to Trigonometry
Textbook	NCERT Mathematics — Class 10 (Ganit)
Class	10
Subject	Mathematics
Exercise Covered	Exercise 8.1 (11 Questions)
Marks Weightage	~12 marks (Unit: Trigonometry)
Difficulty Level	Medium
Academic Year	2026-27

Key Concepts and Trigonometric Ratios — Class 10 Chapter 8

Trigonometry (त्रिकोणमिति) means "measurement of triangles." In a right-angled triangle ABC, right-angled at B, the three sides are named relative to angle A:

- **Opposite side (लम्ब):** BC — the side opposite to angle A
- **Adjacent side (आधार):** AB — the side next to angle A (not the hypotenuse)
- **Hypotenuse (कर्ण):** AC — the longest side, opposite the right angle

The **six trigonometric ratios** for angle A are:

$$\sin A = \frac{\text{Opposite}}{\text{Hypotenuse}} = BC/AC$$

$$\cos A = \frac{\text{Adjacent}}{\text{Hypotenuse}} = AB/AC$$

$$\tan A = \frac{\text{Opposite}}{\text{Adjacent}} = BC/AB$$

$$\operatorname{cosec} A = \frac{1}{\sin A} = AC/BC, \quad \sec A = \frac{1}{\cos A} = AC/AB, \quad \cot A = \frac{1}{\tan A} = AB/BC$$

Key Point: The values of trigonometric ratios depend only on the angle, not on the size of the triangle. Two similar triangles with the same angle A will give the same value of sin A.

The three fundamental trigonometric identities you must know:

$$\sin^2 A + \cos^2 A = 1$$

$$\sec^2 A - \tan^2 A = 1$$

$$\operatorname{cosec}^2 A - \cot^2 A = 1$$

Formula Reference Table — All Six Trigonometric Ratios

Ratio Name	Formula	Reciprocal Of	Range (0° to 90°)
sin A	(Opposite)/(Hypotenuse)	cosec A	0 to 1
cos A	(Adjacent)/(Hypotenuse)	sec A	0 to 1
tan A	(Opposite)/(Adjacent)	cot A	0 to ∞
cosec A	(Hypotenuse)/(Opposite)	sin A	≥ 1
sec A	(Hypotenuse)/(Adjacent)	cos A	≥ 1
cot A	(Adjacent)/(Opposite)	tan A	0 to ∞

NCERT Solutions for Class 10 Maths Chapter 8 Introduction to Trigonometry — Exercise 8.1 (All 11 Questions)

Below are complete, step-by-step solutions for all 11 questions of Exercise 8.1 from the NCERT Class 10 Maths textbook. Every solution shows the full working so you can follow along and write the same steps in your CBSE board exam 2026-27.
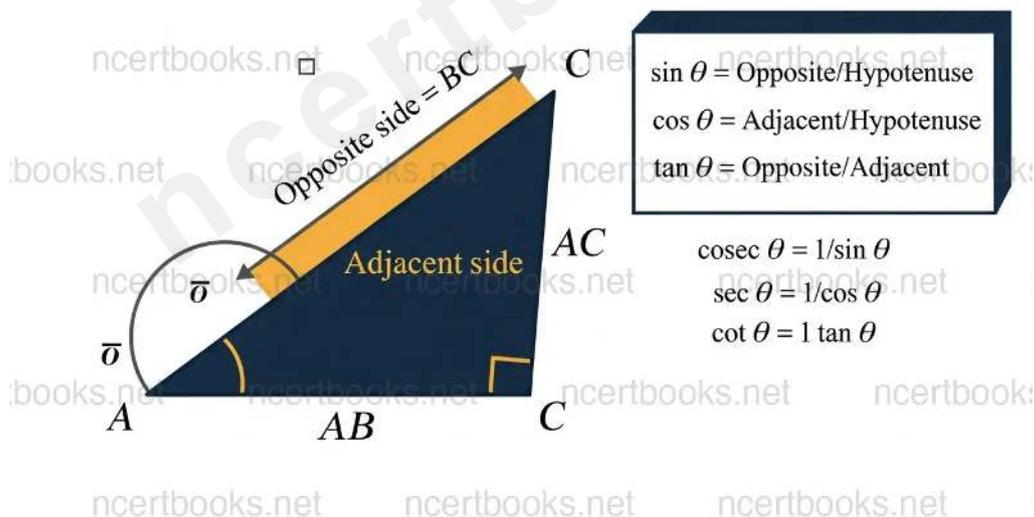

Fig 8.1: Six trigonometric ratios in a right-angled triangle

Question 1

Medium

In ∆ABC right angled at B, AB = 24 cm, BC = 7 cm. Determine: (i) sin A, cos A (ii) sin C, cos C

Finding the hypotenuse AC:

Step 1: Apply the Pythagoras theorem to find AC.

$$AC^2 = AB^2 + BC^2 = 24^2 + 7^2 = 576 + 49 = 625$$

$$AC = \sqrt{625} = 25 \text{ cm}$$

(i) sin A and cos A

Step 2: For angle A, the opposite side is BC = 7 cm and the adjacent side is AB = 24 cm.

$$\sin A = \text{(Opposite)/(Hypotenuse)} = BC/AC = 7/25$$

$$\cos A = \text{(Adjacent)/(Hypotenuse)} = AB/AC = 24/25$$

∴ **sin A = 7/25, cos A = 24/25**

(ii) sin C and cos C

Step 3: For angle C, the opposite side is AB = 24 cm and the adjacent side is BC = 7 cm.

$$\sin C = \text{(Opposite)/(Hypotenuse)} = AB/AC = 24/25$$

$$\cos C = \text{(Adjacent)/(Hypotenuse)} = BC/AC = 7/25$$

Why does this work? Notice that sin A = cos C and cos A = sin C. This is because A and C are complementary angles in a right triangle (A + C = 90°).

∴ **sin C = 24/25, cos C = 7/25**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Always write the Pythagoras step first — examiners award marks for showing the hypotenuse calculation.

Question 2

Medium

In the given figure, find tan P − cot R. (Triangle PQR, right-angled at Q, with PQ = 12 cm, QR = 5 cm, PR = 13 cm)

Step 1: Verify PR using Pythagoras theorem.

$$PR^2 = PQ^2 + QR^2 = 12^2 + 5^2 = 144 + 25 = 169$$

$$PR = \sqrt{169} = 13 \text{ cm checkmark}$$

Step 2: Find tan P. For angle P, opposite side = QR = 5, adjacent side = PQ = 12.

$$\tan P = QR/PQ = 5/12$$

Step 3: Find cot R. For angle R, adjacent side = QR = 5, opposite side = PQ = 12.

$$\cot R = (\text{Adjacent})/(\text{Opposite}) = QR/PQ = 5/12$$

Step 4: Calculate tan P − cot R.

$$\tan P - \cot R = 5/12 - 5/12 = 0$$

Why does this work? In a right triangle, tan P and cot R are always equal because P and R are complementary angles, so their trig ratios are reciprocally related in this way.

∴ **tan P − cot R = 0**

Board Exam Note: This is a favourite 2-3 mark question in CBSE board papers. The answer 0 surprises many students — show all steps to get full marks.

Question 3

Medium

If sin A = 3/4, calculate cos A and tan A.

Key Concept: If sin A = 3/4, then opposite = 3k and hypotenuse = 4k for some positive value k.

Step 1: Find the adjacent side using Pythagoras.

$$\text{Adjacent}^2 = \text{Hypotenuse}^2 - \text{Opposite}^2 = (4k)^2 - (3k)^2 = 16k^2 - 9k^2 = 7k^2$$

$$\text{Adjacent} = k\sqrt{7}$$

Step 2: Calculate cos A and tan A.

$$\cos A = (\text{Adjacent})/(\text{Hypotenuse}) = (k\sqrt{7})/(4k) = (\sqrt{7})/(4)$$

$$\tan A = (\text{Opposite})/(\text{Adjacent}) = (3k)/(k\sqrt{7}) = (3)/(\sqrt{7}) = (3\sqrt{7})/(7)$$

∴ **cos A = (√(7))/(4), tan A = (3)/(√(7)) (or (3√(7))/(7) after rationalisation)**

Board Exam Note: This type of question typically appears in 2-3 mark sections. Remember to rationalise the denominator if it contains a surd — examiners expect the simplified form.

Question 4

Medium

Given 15 cot A = 8, find sin A and sec A.

Step 1: Find cot A from the given equation.

$$15 \cot A = 8 \Rightarrow \cot A = 8/15$$

Step 2: Since cot A = (Adjacent)/(Opposite), let adjacent = 8k and opposite = 15k.

Step 3: Find the hypotenuse using Pythagoras.

$$\text{Hypotenuse}^2 = (8k)^2 + (15k)^2 = 64k^2 + 225k^2 = 289k^2$$

$$\text{Hypotenuse} = 17k$$

Step 4: Calculate sin A and sec A.

$$\sin A = (\text{Opposite})/(\text{Hypotenuse}) = 15k/17k = 15/17$$

$$\sec A = (\text{Hypotenuse})/(\text{Adjacent}) = 17k/8k = 17/8$$

∴ **sin A = 15/17, sec A = 17/8**

Board Exam Note: This type of question typically appears in 2-3 mark sections. The 8-15-17 Pythagorean triple is a common one — recognising it saves calculation time.

Question 5

Hard

Given sec θ = 13/12, calculate all other trigonometric ratios.

Step 1: Since sec θ = (Hypotenuse)/(Adjacent) = 13/12, let hypotenuse = 13k and adjacent = 12k.

Step 2: Find the opposite side using Pythagoras.

$$\text{Opposite}^2 = \text{Hypotenuse}^2 - \text{Adjacent}^2 = (13k)^2 - (12k)^2 = 169k^2 - 144k^2 = 25k^2$$

$$\text{Opposite} = 5k$$

Step 3: Write all six trigonometric ratios.

$$\sin \theta = 5k/13k = 5/13$$

$$\cos \theta = 12k/13k = 12/13$$

$$\tan \theta = 5k/12k = 5/12$$

$$\csc \theta = 13/5$$

$$\sec \theta = 13/12 \text{ (given)}$$

$$\cot \theta = 12/5$$

∴ **sin θ = 5/13, cos θ = 12/13, tan θ = 5/12, cosec θ = 13/5, sec θ = 13/12, cot θ = 12/5**

Board Exam Note: "Find all trig ratios" questions appear in long answer sections of CBSE board papers. Write all six ratios clearly — each carries partial marks.

Question 6

Hard

If ∠A and ∠B are acute angles such that cos A = cos B, then show that ∠A = ∠B.

Key Concept: This is a proof question. We use the definition of cosine in a right triangle.

Step 1: Consider a right triangle ABC right-angled at C. Then:

$$\cos A = AC/AB \text{ and } \cos B = BC/AB$$

Step 2: Given that cos A = cos B:

$$AC/AB = BC/AB$$

$$\therefore AC = BC$$

Step 3: Since AC = BC, triangle ABC is an isosceles triangle. In an isosceles triangle, the angles opposite equal sides are equal.

The angle opposite AC is ∠B, and the angle opposite BC is ∠A.

$$\therefore \angle A = \angle B$$

Why does this work? The cosine ratio equals adjacent/hypotenuse. If two acute angles have the same cosine, their adjacent sides (relative to the same hypotenuse) must be equal, making the triangle isosceles and the angles equal.

∴ **∠A = ∠B (Proved)**

Board Exam Note: Proof questions appear in long answer sections. Write each step with a reason — "In isosceles triangle, angles opposite equal sides are equal" is the key reason here.

Question 7

Hard

If cot θ = 7/8, evaluate: (i) $((1+\sin\theta)(1-\sin\theta))/((1+\cos\theta)(1-\cos\theta))$ (ii) cot²θ

Finding the sides first:

Step 1: Since cot θ = 7/8, let adjacent = 7k and opposite = 8k.

$$\text{Hypotenuse}^2 = (7k)^2 + (8k)^2 = 49k^2 + 64k^2 = 113k^2$$

$$\text{Hypotenuse} = k\sqrt{113}$$

$$\sin\theta = \frac{8k}{k\sqrt{113}} = \frac{8}{\sqrt{113}}, \cos\theta = \frac{7k}{k\sqrt{113}} = \frac{7}{\sqrt{113}}$$

(i) Evaluating the expression

Step 2: Use the identity (1+sinθ)(1-sinθ) = 1 - sin²θ = cos²θ and (1+cosθ)(1-cosθ) = 1 - cos²θ = sin²θ.

$$\frac{(1+\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)} = \frac{\cos^2\theta}{\sin^2\theta} = \cot^2\theta$$

$$= (7/8)^2 = 49/64$$

∴ **Expression = 49/64**

(ii) cot²θ

Step 3: Simply square the given cot θ value.

$$\cot^2\theta = (7/8)^2 = 49/64$$

∴ **cot²θ = 49/64**

Board Exam Note: Using the identity shortcut in part (i) saves time. Examiners award marks for recognising that the expression simplifies to cot²θ — always mention the identity used.

Question 8

Hard

If 3 cot A = 4, check whether (1-tan² A)/(1+tan² A) = cos² A - sin² A or not.

Step 1: Find cot A and then the sides of the triangle.

$$3 \cot A = 4 \Rightarrow \cot A = 4/3 \Rightarrow \tan A = 3/4$$

Let adjacent = 4k, opposite = 3k.

$$\text{Hypotenuse} = \sqrt{(4k)^2 + (3k)^2} = \sqrt{16k^2 + 9k^2} = \sqrt{25k^2} = 5k$$

$$\sin A = 3k/5k = 3/5, \cos A = 4k/5k = 4/5, \tan A = 3/4$$

Step 2: Calculate the Left Hand Side (LHS).

LHS = (1 - tan² A)/(1 + tan² A) = (1 - (3/4)²)/(1 + (3/4)²) = (1 - 9/16)/(1 + 9/16) = (7/16)/
(25/16) = 7/25

Step 3: Calculate the Right Hand Side (RHS).

RHS = cos² A - sin² A = (4/5)² - (3/5)² = 16/25 - 9/25 = 7/25

Step 4: Compare LHS and RHS.

LHS = 7/25 = RHS

∴ **Yes, (1-tan² A)/(1+tan² A) = cos² A - sin² A is verified.**

Board Exam Note: Always calculate LHS and RHS separately, then state "LHS = RHS" — this structure is mandatory for full marks in verification problems.

Question 9

Hard

In triangle ABC, right angled at B, if tan A = (1)/(√(3)), find the value of: (i) sin A cos C + cos A sin C (ii) cos A cos C − sin A sin C

Finding all ratios first:

Step 1: Since tan A = 1/√3, let opposite = 1k, adjacent = √3 k.

Hypotenuse = √((1k)² + (sqrt3)k)² = √(k² + 3k²) = √(4k²) = 2k

sin A = 1k/2k = 1/2, cos A = (√(3)k)/(2k) = (√(3))/(2)

Step 2: Since A + C = 90° (right angle at B), angle C = 90° − A.

sin C = sin(90° - A) = cos A = (√(3))/(2)

cos C = cos(90° - A) = sin A = 1/2

(i) sin A cos C + cos A sin C

Step 3: Substitute the values.

sin A cos C + cos A sin C = 1/2 × 1/2 + (√(3))/(2) × (√(3))/(2) = 1/4 + 3/4 = 1

Why does this work? The expression sin A cos C + cos A sin C = sin(A + C) = sin 90° = 1. This is the sine addition formula.

∴ **sin A cos C + cos A sin C = 1**

(ii) cos A cos C − sin A sin C

Step 4: Substitute the values.

cos A cos C - sin A sin C = (√(3))/(2) × 1/2 - 1/2 × (√(3))/(2) = (√(3))/(4) - (√(3))/(4) = 0

Why does this work? The expression cos A cos C − sin A sin C = cos(A + C) = cos 90° = 0.

∴ **cos A cos C − sin A sin C = 0**

Board Exam Note: This question tests both trig ratio calculation and complementary angle concepts. Showing the complementary angle step earns extra marks.

Question 10

Hard

In ΔPQR, right-angled at Q, PR + QR = 25 cm and PQ = 5 cm. Determine the values of sin P, cos P and tan P.

Step 1: Let QR = x cm. Then PR = 25 − x cm (since PR + QR = 25).

Step 2: Apply Pythagoras theorem to triangle PQR (right angle at Q).

$$PR^2 = PQ^2 + QR^2$$

$$(25 - x)^2 = 5^2 + x^2$$

$$625 - 50x + x^2 = 25 + x^2$$

$$625 - 50x = 25$$

$$50x = 600$$

$$x = 12$$

Step 3: Therefore QR = 12 cm and PR = 25 − 12 = 13 cm.

Verification: $13^2 = 169$ and $5^2 + 12^2 = 25 + 144 = 169$ ✓

Step 4: Calculate sin P, cos P, and tan P. For angle P: opposite = QR = 12, adjacent = PQ = 5, hypotenuse = PR = 13.

$$\sin P = QR/PR = 12/13$$

$$\cos P = PQ/PR = 5/13$$

$$\tan P = QR/PQ = 12/5$$

∴ **sin P = 12/13, cos P = 5/13, tan P = 12/5**

Board Exam Note: This is a multi-step problem frequently appearing in long answer sections. The algebraic step of forming and solving the equation for x is where most marks are awarded — show every step clearly.

Question 11

Easy

State whether the following statements are true or false. Justify your answer. (i) The value of tan A is always less than 1. (ii) sec A = 12/5 for some value of angle A. (iii) cos A is the abbreviation used for the cosecant of angle A. (iv) cot A is the product of cot and A. (v) sin θ = 4/3 for some angle θ.

(i) The value of tan A is always less than 1.

$$\tan A = (\text{Opposite})/(\text{Adjacent})$$

This can take any positive value depending on the lengths of the opposite and adjacent sides. For example, in a 3-4-5 triangle, tan A can be 3/4 (less than 1) or 4/3 (greater than 1).

FALSE. tan A can be greater than 1, equal to 1, or less than 1 depending on the angle.

(ii) sec A = 12/5 for some value of angle A.

Since sec A = (Hypotenuse)/(Adjacent) and hypotenuse is always the longest side, sec A ≥ 1 for all acute angles. Since 12/5 = 2.4 > 1, this is possible.

TRUE. sec A = 12/5 is valid since sec A ≥ 1 for all acute angles, and 12/5 > 1.

(iii) cos A is the abbreviation used for the cosecant of angle A.

"cos" stands for **cosine**, not cosecant. The abbreviation for cosecant is "cosec" or "csc".

FALSE. cos A stands for cosine of A, not cosecant. Cosecant is written as cosec A.

(iv) cot A is the product of cot and A.

"cot A" is a single trigonometric ratio — cot of angle A. It is not the multiplication of two separate quantities "cot" and "A". "cot" has no meaning on its own without an angle.

FALSE. cot A is the cotangent of angle A — it is one combined ratio, not a product of two separate values.

(v) sin θ = 4/3 for some angle θ.

For any acute angle θ, sin θ = (Opposite)/(Hypotenuse). Since the hypotenuse is always the longest side, opposite < hypotenuse, so sin θ < 1 always. Since 4/3 > 1, this is impossible.

FALSE. sin θ cannot exceed 1 for any acute angle. Since 4/3 > 1, this value is impossible.

Board Exam Note: True/False questions with justification appear as 1-mark items in CBSE board papers. Always write the reason — an answer without justification may not receive full marks.
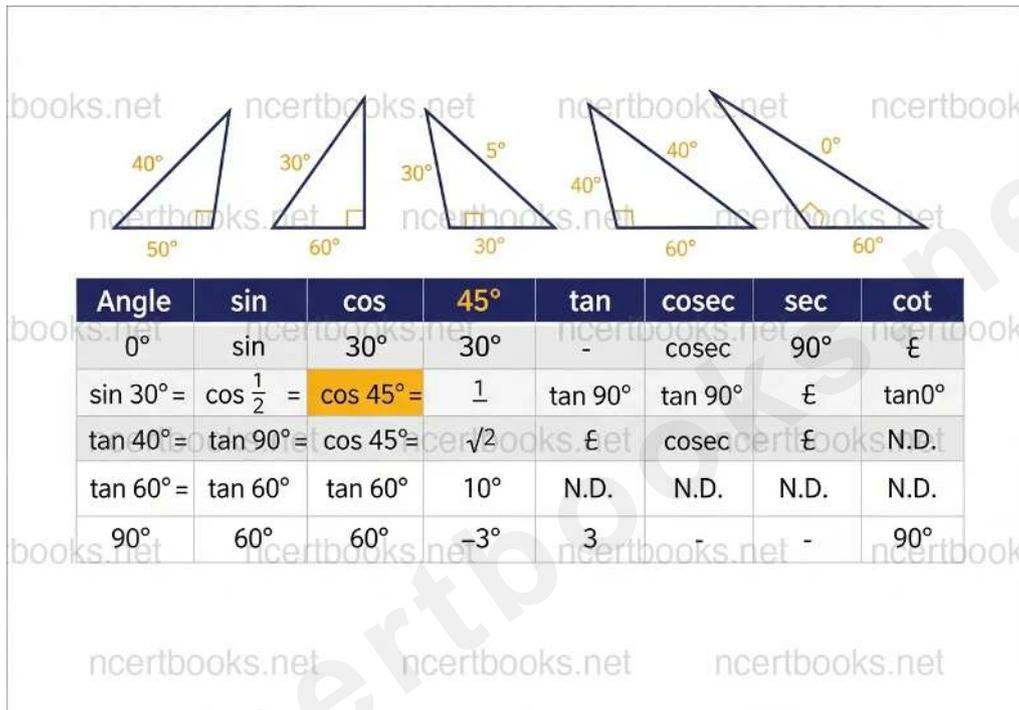

Angle	sin	cos	45°	tan	cosec	sec	cot
0°	sin	30°	30°	-	cosec	90°	£
sin 30° =	cos $\frac{1}{2}$ =	cos 45° =	1	tan 90°	tan 90°	£	tan0°
tan 40° =	tan 90° =	cos 45°=	√2	£	cosec	£	N.D.
tan 60° =	tan 60°	tan 60°	10°	N.D.	N.D.	N.D.	N.D.
90°	60°	60°	−3°	3	-	-	90°

Fig 8.2: Standard trigonometric values for angles 0° to 90°

Solved Examples Beyond NCERT — Class 10 Maths Chapter 8

These extra examples go slightly beyond the NCERT textbook and are useful for CBSE board exam preparation 2026-27 and for students who want deeper practice.

Extra Example 1

Medium

If tan A = 5/12, find the value of (sin A + cos A) × cosec A.

Step 1: Let opposite = 5, adjacent = 12. Hypotenuse = √(25 + 144) = √(169) = 13.

$$\sin A = 5/13, \cos A = 12/13, \operatorname{cosec} A = 13/5$$

Step 2: Substitute.

(sin A + cos A) × cosec A = (5/13 + 12/13) × 13/5 = 17/13 × 13/5 = 17/5

∴ **Answer = 17/5**

Extra Example 2

Medium

In a right triangle, if sin A = 5/13, verify that $\sin^2 A + \cos^2 A = 1$.

Step 1: Opposite = 5, hypotenuse = 13. Adjacent = $\sqrt{(169 - 25)}$ = $\sqrt{(144)}$ = 12.

$$\cos A = 12/13$$

Step 2: Verify the identity.

$\sin^2 A + \cos^2 A = (5/13)^2 + (12/13)^2$ = 25/169 + 144/169 = 169/169 = 1 checkmark

∴ **Identity verified: $\sin^2 A + \cos^2 A = 1$**

Extra Example 3

Hard

If cosec θ − cot θ = 1/3, find the value of cosec θ + cot θ.

Key Concept: Use the identity $\csc^2 \theta - \cot^2 \theta = 1$, which factors as (cosec θ + cot θ)(cosec θ - cot θ) = 1.

Step 1: Let cosec θ + cot θ = x. Then:

$$x \times 1/3 = 1 \Rightarrow x = 3$$

∴ **cosec θ + cot θ = 3**

Important Questions for CBSE Board Exam — Class 10 Maths Chapter 8

These questions are based on the CBSE 2026-27 marking scheme and frequently appear in board papers. Practice these to score full marks in the Trigonometry unit.

1-Mark Questions (Definition / MCQ Type)

1. **Q:** What is the value of sin 0°? **A:** 0
2. **Q:** If tan A = 1, what is angle A? **A:** 45°
3. **Q:** What is the range of cos A for acute angles? **A:** 0 < cos A ≤ 1

3-Mark Questions (Application)

1. **Q:** In a right triangle, if sin A = 3/5, find all other five trigonometric ratios.
   A: cos A = 4/5, tan A = 3/4, cosec A = 5/3, sec A = 5/4, cot A = 4/3 (using Pythagoras: opposite = 3, hypotenuse = 5, adjacent = 4).
2. **Q:** If 5 tan A = 4, find the value of (5sin A - 3cos A)/(5sin A + 2cos A).
   A: tan A = 4/5, so sin A = 4/√41, cos A = 5/√41. Substituting: (5 · (4)/(√(41))) - 3 · (5)/(√(41)))/(5 · (4)/(√(41)) + 2 · (5)/(√(41))) = (20 - 15)/(20 + 10) = 5/30 = 1/6

5-Mark Question (Long Answer)

Q: In a right triangle ABC right-angled at C, if tan A = 1/√3 and tan B = √3, verify that sin A cos B + cos A sin B = 1.

A: tan A = 1/√3 gives A = 30°, so sin A = 1/2, cos A = √3/2. tan B = √3 gives B = 60°, so sin B = √3/2, cos B = 1/2. LHS = (1/2)(1/2) + (√3/2)(√3/2) = 1/4 + 3/4 = 1 = RHS. ✓

Common Mistakes Students Make in Trigonometry — Class 10

Mistake 1: Writing sin A = opposite/adjacent instead of opposite/hypotenuse.

Why it's wrong: sin is always opposite over hypotenuse. Opposite/adjacent is tan.

Correct approach: Remember SOH-CAH-TOA: Sin = Opposite/Hypotenuse, Cos = Adjacent/Hypotenuse, Tan = Opposite/Adjacent.

Mistake 2: Forgetting to find the missing side using Pythagoras before writing ratios.

Why it's wrong: You cannot write all six ratios without knowing all three sides.

Correct approach: Always use Hyp² = Base² + Perp² as your first step.

Mistake 3: Claiming tan A is always less than 1.

Why it's wrong: tan A = opposite/adjacent. If opposite > adjacent, tan A > 1.

Correct approach: tan A can be any positive value — there is no upper bound.

Mistake 4: In verification problems, calculating LHS and RHS together instead of separately.

Why it's wrong: Examiners want to see LHS and RHS calculated independently, then compared.

Correct approach: Write "LHS = ..." and "RHS = ..." separately, then conclude "LHS = RHS, hence verified."

Mistake 5: Confusing cos A (cosine) with cosec A (cosecant).

Why it's wrong: These are completely different ratios — cos A = adjacent/hypotenuse, cosec A = hypotenuse/opposite.

Correct approach: Always write the full form once in your exam answer to show you know the difference.
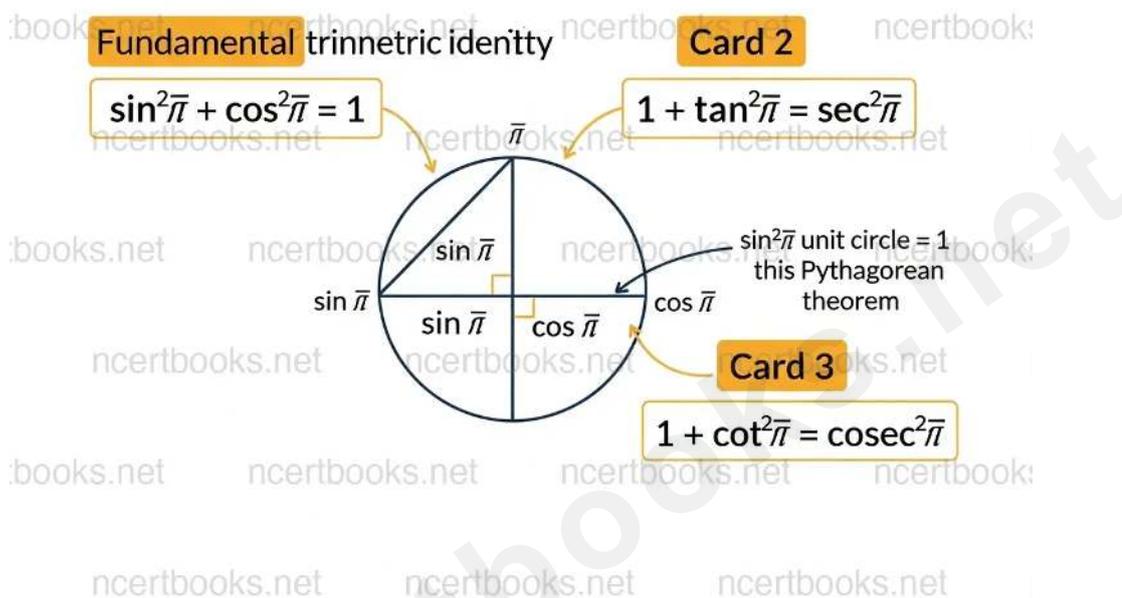

Fig 8.3: Three fundamental trigonometric identities and the unit circle connection

Exam Tips for 2026-27 CBSE Board — Class 10 Maths Chapter 8

- **Show Pythagoras first:** In every problem where you need to find trig ratios from given sides, write the Pythagoras step explicitly. The CBSE 2026-27 marking scheme awards 1 mark specifically for this step.
- **Write all six ratios when asked:** If a question says "find all trigonometric ratios," write all six — sin, cos, tan, cosec, sec, cot. Each is worth partial marks.
- **Use the identity shortcut:** In Q7 type problems, recognise that $(1+\sin\theta)(1-\sin\theta) = \cos^2\theta$. This saves time in board exams.
- **LHS = RHS structure:** For all "verify" or "check whether" questions, always compute LHS and RHS separately. Never manipulate both sides simultaneously.
- **Justify True/False:** In Q11 type questions, a True/False answer without justification may get zero marks. Always write 1-2 lines of reason.
- **Chapter 8 weightage:** The Trigonometry unit (Chapters 8 + 9) carries approximately 12 marks in the CBSE Class 10 board exam 2026-27. Chapter 8 alone can contribute 6-8 marks — do not skip any exercise.

Frequently Asked Questions — Introduction to Trigonometry Class 10

How to find sin A and cos A in a right triangle for Class 10 NCERT?

In a right triangle ABC right-angled at B, sin A = BC/AC (opposite over hypotenuse) and cos A = AB/AC (adjacent over hypotenuse). Your first step is always to find the hypotenuse using the Pythagoras theorem if it is not given. This is the standard method for all Exercise 8.1 questions in NCERT Class 10 Maths Chapter 8.

What are all six trigonometric ratios in Class 10 NCERT Chapter 8?

The six trigonometric ratios for angle A in a right triangle are: sin A (opposite/hypotenuse), cos A (adjacent/hypotenuse), tan A (opposite/adjacent), cosec A (hypotenuse/opposite), sec A (hypotenuse/adjacent), and cot A (adjacent/opposite). NCERT Class 10 Chapter 8 defines all six and shows that cosec, sec, and cot are simply the reciprocals of sin, cos, and tan respectively.

What is the answer to NCERT Exercise 8.1 Question 2 — tan P minus cot R?

In NCERT Exercise 8.1 Question 2, triangle PQR is right-angled at Q with PQ = 12 cm and QR = 5 cm. Using Pythagoras, PR = 13 cm. tan P = QR/PQ = 5/12 and cot R = QR/PQ = 5/12. Therefore tan P − cot R = 5/12 − 5/12 = 0. This result is always 0 because in a right triangle, tan of one acute angle equals cot of the other.

Is sin θ = 4/3 possible for any angle in Class 10 trigonometry?

No, sin θ = 4/3 is not possible for any acute angle. The sine of an angle equals opposite/hypotenuse. Since the hypotenuse is always the longest side of a right triangle, the opposite side is always shorter than the hypotenuse, making sin θ always less than 1. Since 4/3 ≈ 1.33 is greater than 1, it cannot be the sine of any angle. This is a standard Q11-type false statement in NCERT Exercise 8.1.

How many marks does Introduction to Trigonometry carry in CBSE Class 10 board exam 2026-27?

In the CBSE Class 10 Maths board exam 2026-27, the Trigonometry unit (which includes Chapter 8 Introduction to Trigonometry and Chapter 9 Some Applications of Trigonometry) carries approximately 12 marks. Questions appear as 1-mark MCQs, 2-mark short answers, and 3-mark or 5-mark long answer questions. Exercise 8.1 questions on finding trig ratios from given conditions are the most frequently tested topics from this chapter.

What are the NCERT solutions for Class 10 Maths Exercise 8.1 Question 10 — the PR + QR = 25 pro

In this problem, let QR = x, so PR = 25 − x. Applying Pythagoras: $(25 − x)^2 = 5^2 + x^2$, which gives $625 − 50x = 25$, so $x = 12$. Therefore QR = 12 cm and PR = 13 cm. The trig ratios are: sin P = 12/13, cos P = 5/13, and tan P = 12/5. This is a multi-step algebraic-trigonometry problem worth 3-5 marks in CBSE board exams.