

CBSE CLASS X
Mathematics Standard (041)
QUESTION PAPER

From previous CBSE Board Exam questions

Code: HAJQTI **Questions: 121** **Maximum Marks: 258** **Generated: 2026-06-15 13:05**

SELECTIONS USED

Source	Previous-year board
Subject	Mathematics
Lessons	Introduction to Trigonometry
Year	2022-2026
Questions selected	121

Composition — Types: 41 MCQ · 37 Very short · 26 Short · 10 Long · 5 Assertion–reason · 3 Case-based

Q1. § 7.2 Distance Formula

[1]

The distance between the points $(a \cos \theta + b \sin \theta, 0)$ and $(0, a \sin \theta - b \cos \theta)$ is

- A $\sqrt{a^2 + b^2}$
 B $a^2 - b^2$
 C $\sqrt{a^2 - b^2}$
 D $a^2 + b^2$

Previously asked in: 2026 30/4/1 Q15

◆ Coordinate Geometry

7.2 Distance Formula

8.4 Trigonometric Identities

Q2. § 8.5 Summary

[1]

If $4 \sec \theta - 5 = 0$, then the value of $\cot \theta$ is :

- A $\frac{3}{4}$
 B $\frac{5}{4}$
 C $\frac{3}{5}$
 D $\frac{4}{3}$

Previously asked in: 2024 30/5/1 Q3

◆ Introduction to Trigonometry

8.2 Trigonometric Ratios

Q3. § 8.5 Summary

[1]

For an acute angle θ , if $\sin \theta = \frac{1}{9}$, then value of $\frac{9 \csc \theta + 1}{9 \csc \theta - 1}$ is

- (A) 0
 (B) $\frac{80}{81}$
 (C) 1
 (D) $\frac{82}{80}$

Previously asked in: 2026 30/5/1 Q14

◆ Introduction to Trigonometry

8.2 Trigonometric Ratios

Q4. § 8.2 Trigonometric Ratios § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

If θ is an acute angle of a right angled triangle, then which of the following equation is not true?

A $\sin \theta \cot \theta = \cos \theta$

B $\cos \theta \tan \theta = \sin \theta$

C $\csc^2 \theta - \cot^2 \theta = 1$

D $\tan^2 \theta - \sec^2 \theta = 1$

Previously asked in: 2023 30/6/1 Q16

♦ Introduction to Trigonometry 8.2 Trigonometric Ratios

Q5. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[2]

Vertices of a right triangle ABC with $\angle B = 90^\circ$ are $A(3, 4)$, $B(1, 1)$ and $C(-8, 7)$. Find the value of $\tan A$.

Previously asked in: 2026 30/5/1 Q22(a) (OR-1)

♦ Introduction to Trigonometry 8.2 Trigonometric Ratios

Q6. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

Evaluate: $\frac{\sin^3 60^\circ - \tan 30^\circ}{\cos^2 45^\circ}$

Previously asked in: 2026 30/5/1 Q24(a) (OR-1)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q7. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[2]

For acute angles A and B , if $A + 2B$ and $2A + B$ are acute, $\tan(A + 2B) = \sqrt{3}$ and $\sin(2A + B) = \frac{1}{2}$, then find the measures of angles A and B .

Previously asked in: 2026 30/5/1 Q24(b) (OR-2)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q8. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.4 Trigonometric Identities § 8.5 Summary

[1]

If $\cos(\alpha + \beta) = 0$, then value of $\cos\left(\frac{\alpha + \beta}{2}\right)$ is equal to :

(a) $\frac{1}{\sqrt{2}}$

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

(c) 0

(d) $\sqrt{2}$

Previously asked in: 2024 30/1/1 Q12

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q9. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

Evaluate : $2\sqrt{2} \cos 45^\circ \sin 30^\circ + 2\sqrt{3} \cos 30^\circ$

Previously asked in: 2024 30/1/1 Q23(A)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q10. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

If $4 \cot^2 45^\circ - \sec^2 60^\circ + \sin^2 60^\circ + p = \frac{3}{4}$, then find the value of p .

Previously asked in: 2023 30/2/1 Q22(a) (OR-1)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q11. § 8.5 Summary

[2]

If A and B are acute angles such that $\sin(A - B) = 0$ and $2 \cos(A + B) - 1 = 0$, then find angles A and B.

Previously asked in: 2023 30/4/1 Q25(B) (OR-2)

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q12. § Introduction to Trigonometry (Chapter Header and Quote) § 8.5 Summary

[1]

If $\tan \theta = \frac{5}{12}$, then the value of $\frac{\sin \theta - \cos \theta}{\sin \theta + \cos \theta}$ is :

- (a) $\frac{17}{7}$
 (b) $\frac{17}{17}$
 (c) $\frac{17}{13}$
 (d) $\frac{7}{13}$

Previously asked in: 2023 30/5/1 Q6

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

Q13. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

$\frac{2 \tan 30^\circ}{1 - \tan^2 30^\circ}$ is equal to :

- (a) $\sin 60^\circ$
 (b) $\cos 60^\circ$
 (c) $\tan 60^\circ$
 (d) $\sin 30^\circ$

Previously asked in: 2023 30/5/1 Q12

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q14. § 8.5 Summary

[1]

When $\sin A = \frac{1}{3}$, the value of $\cot A$ is

- A $\frac{2\sqrt{2}}{3}$
 B $2\sqrt{2}$
 C $\frac{1}{2\sqrt{2}}$
 D 3

Previously asked in: 2026 30/4/1 Q11

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

Q15. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[2]

Evaluate: $\frac{3 \cos^2 30^\circ - 6 \operatorname{cosec}^2 30^\circ}{\tan^2 60^\circ}$

Previously asked in: 2026 30/4/1 Q23 (OR-2)

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q16. § Introduction to Trigonometry (Chapter Header and Quote) § 8.5 Summary

[2]

If $\tan \theta = \frac{24}{7}$, then find the value of $\sin \theta + \cos \theta$.

Previously asked in: 2026 30/1/1 Q24(A)

♦ Introduction to Trigonometry 8.2 Trigonometric Ratios

Q17. § 8.5 Summary

[1]

If $\cos A = \frac{4}{5}$, then the value of $\tan A$ is :

- A $\frac{3}{5}$
- B $\frac{4}{3}$
- C $\frac{4}{5}$
- D $\frac{3}{4}$

Previously asked in: 2026 30/2/1 Q10

♦ Introduction to Trigonometry 8.2 Trigonometric Ratios

Q18. § Introduction to Trigonometry (Chapter Header and Quote) § 8.5 Summary

[1]

If θ is an acute angle and $7 + 4 \sin \theta = 9$, then the value of θ is:

- A 90°
- B 30°
- C 45°
- D 60°

Previously asked in: 2025 30/1/1 Q4

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q19. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

The value of $\tan^2 30^\circ - \frac{1}{\cos^2 60^\circ}$ is:

- A 1
- B 0
- C -1
- D $\frac{1}{2}$

Previously asked in: 2025 30/1/1 Q5

♦ Introduction to Trigonometry 8.2 Trigonometric Ratios 8.3 Trigonometric Ratios of Some Specific Angles

Q20. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

If $x \cos 60^\circ + y \cos 0^\circ + \sin 30^\circ - \cot 45^\circ = 5$, then find the value of $x + 2y$.

Previously asked in: 2025 30/1/1 Q21 (OR-1)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q21. § 8.3 Trigonometric Ratios of Some Specific Angles

[1]

Given that $\sin 2\alpha = \frac{\sqrt{3}}{2}$, the value of $\sin 3\alpha$ is :

- A $\frac{3\sqrt{3}}{4}$
- B $\frac{1}{2}$
- C 1
- D $\frac{\sqrt{3}}{4}$

Previously asked in: 2026 30/3/1 Q15

♦ Introduction to Trigonometry 8.2 Trigonometric Ratios 8.3 Trigonometric Ratios of Some Specific Angles

Q22. § 8.3 Trigonometric Ratios of Some Specific Angles

[1]

The value of $\left(\frac{1}{2} \tan^2 45^\circ - \cos^2 60^\circ\right)$ is :

- A 0
 B $-\frac{1}{2}$
 C $\frac{1}{4}$
 D $-\frac{1}{4}$

Previously asked in: 2026 30/3/1 Q18

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q23. § 8.3 Trigonometric Ratios of Some Specific Angles

[1]

Directions: Select the correct answer from the codes (A), (B), (C) and (D). Assertion (A): $\tan 2\theta$ is not defined at $\theta = 45^\circ$. Reason (R): $\sin 90^\circ \neq \cos 90^\circ$.

- A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
 B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
 C Assertion (A) is true, but Reason (R) is false.
 D Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2026 30/3/1 Q20

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q24. § 8.3 Trigonometric Ratios of Some Specific Angles

[1]

If $\sin 30^\circ \cdot \tan 45^\circ = \frac{\sqrt{k}}{2}$, then the value of k is :

- A 4
 B 3
 C 2
 D 1

Previously asked in: 2025 30/2/1 Q13

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q25. § 8.5 Summary

[2]

If $\tan A = \frac{\sqrt{3}-1}{\sqrt{3}+1}$, where A is an acute angle, then find the value of $\sin A - \cos A$.

Previously asked in: 2025 30/2/1 Q23

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.3 Trigonometric Ratios of Some Specific Angles

Q26. § 8.2 Trigonometric Ratios § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

 $\tan 2A = 3 \tan A$ is true, when the measure of $\angle A$ is :

- (a) 90°
 (b) 60°
 (c) 45°
 (d) 30°

Previously asked in: 2025 30/4/1 Q8

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q27. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.4 Trigonometric Identities

[1]

Which of the following statements is true ?

- (a) $\sin 20^\circ > \sin 70^\circ$
 (b) $\sin 20^\circ > \cos 20^\circ$
 (c) $\cos 20^\circ > \cos 70^\circ$
 (d) $\tan 20^\circ > \tan 70^\circ$

Previously asked in: 2025 30/4/1 Q9

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q28. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[2]

If $4k = \tan^2 60^\circ - 2 \operatorname{cosec}^2 30^\circ - 2 \tan^2 30^\circ$, then find the value of k .

Previously asked in: 2025 30/3/1 Q21

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q29. § 8.3 Trigonometric Ratios of Some Specific Angles

[1]

If $\sin \theta = \cos \theta$, ($0^\circ < \theta < 90^\circ$), then value of $(\sec \theta \cdot \sin \theta)$ is

- (A) $\frac{1}{\sqrt{2}}$
 (B) $\sqrt{2}$
 (C) 1
 (D) 0

Previously asked in: 2024 30/2/1 Q7

♦ Introduction to Trigonometry 8.2 Trigonometric Ratios 8.3 Trigonometric Ratios of Some Specific Angles

Q30. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

It is given that $\sin(A - B) = \sin A \cos B - \cos A \sin B$. Use it to find the value of $\sin 15^\circ$.

Previously asked in: 2025 30/5/1 Q23(a)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q31. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

Evaluate: $2 \sin^2 30^\circ \cdot \sec 60^\circ + \tan^2 60^\circ$.

Previously asked in: 2024 30/2/1 Q23(a) (OR-1)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q32. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

If $2 \sin(A + B) = \sqrt{3}$ and $\cos(A - B) = 1$, then find the measures of angles A and B. $0 \leq A, B, (A + B) \leq 90^\circ$.

Previously asked in: 2024 30/2/1 Q23(b) (OR-2)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q33. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[3]

Let $2A + B$ and $A + 2B$ be acute angles such that $\sin(2A + B) = \frac{\sqrt{3}}{2}$ and $\tan(A + 2B) = 1$. Find the value of $\cot(4A - 7B)$.

Previously asked in: 2025 30/5/1 Q30(b)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles

Q34. § 8.3 Trigonometric Ratios of Some Specific Angles

[1]

If $x \left(\frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ} \right) = y \left(\frac{2 \tan 30^\circ}{1 - \tan^2 30^\circ} \right)$, then $x : y =$

- A 1 : 1
 B 1 : 2
 C 2 : 1
 D 4 : 1

Previously asked in: 2025 30/6/1 Q12

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q35. § 8.2 Trigonometric Ratios § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

In a right triangle ABC, right-angled at A, if $\sin B = \frac{1}{4}$, then the value of $\sec B$ is

- A 4
 B $\frac{\sqrt{15}}{4}$
 C $\sqrt{15}$
 D $\frac{4}{\sqrt{15}}$

Previously asked in: 2025 30/6/1 Q18

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

Q36. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

Evaluate : $\frac{\cos 45^\circ + \sin 60^\circ}{\sec 30^\circ + \operatorname{cosec} 30^\circ}$

Previously asked in: 2024 30/3/1 Q25

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q37. § 8.3 Trigonometric Ratios of Some Specific Angles

[1]

 $\left[\frac{3}{4} \tan^2 30^\circ - \sec^2 45^\circ + \sin^2 60^\circ \right]$ is equal to

- A -1
 B $\frac{5}{6}$
 C $\frac{-3}{2}$
 D $\frac{1}{6}$

Previously asked in: 2023 30/1/1 Q9

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q38. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

If $\sin \theta = 1$, then the value of $\frac{1}{2} \sin \left(\frac{\theta}{2} \right)$ is :

- A $\frac{1}{2\sqrt{2}}$
 B $\frac{1}{2}$
 C $\frac{1}{2}$
 D 0

Previously asked in: 2024 30/4/1 Q10

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q39. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary**[2]**

If $\sin \alpha = \frac{1}{\sqrt{2}}$ and $\cot \beta = \sqrt{3}$, then find the value of $\csc \alpha + \csc \beta$.

Previously asked in: 2023 30/1/1 Q23(b) (OR-2)

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q40. § 8.3 Trigonometric Ratios of Some Specific Angles**[2]**

Evaluate :

$$\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \sin^2 60^\circ}$$

Previously asked in: 2024 30/4/1 Q23(a) (OR-1)

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q41. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary**[2]**

If $\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$; $0 < A + B \leq 90^\circ$, $A > B$; find $\angle A$ and $\angle B$.

Previously asked in: 2024 30/4/1 Q23(b) (OR-2)

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Q42. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary**[1]**

If $\frac{x}{3} = 2 \sin A$, $\frac{y}{3} = 2 \cos A$, then the value of $x^2 + y^2$ is :

A 36

B 9

C 6

D 18

Previously asked in: 2024 30/5/1 Q2

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q43. § 8.5 Summary**[1]**

Simplest form of $\frac{\sec A}{\sqrt{\sec^2 A - 1}}$ is

(A) $\sin A$ (B) $\tan A$ (C) $\csc A$ (D) $\cos A$

Previously asked in: 2026 30/5/1 Q18

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q44. § 8.2 Trigonometric Ratios § 8.4 Trigonometric Identities § 8.5 Summary

[1]

A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

Statement A (Assertion): For $0 < \theta \leq 90^\circ$, $\csc \theta - \cot \theta$ and $\csc \theta + \cot \theta$ are reciprocal of each other.

Statement R (Reason): $\csc^2 \theta - \cot^2 \theta = 1$

- A Both Assertion (A) and Reason (R) are true; and Reason (R) is the correct explanation of Assertion (A).
 B Both Assertion (A) and Reason (R) are true; but Reason (R) is not the correct explanation of Assertion (A).
 C Assertion (A) is true but Reason (R) is false.
 D Assertion (A) is false but Reason (R) is true.

Previously asked in: 2023 30/6/1 Q20

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q45. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

Evaluate :

$$\frac{2 \tan 30^\circ \cdot \sec 60^\circ \cdot \tan 45^\circ}{1 - \sin^2 60^\circ}$$

Previously asked in: 2024 30/5/1 Q22

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles 8.4 Trigonometric Identities

Q46. § 8.5 Summary

[3]

Prove that $\frac{1+\sec A}{\sec A} = \frac{\sin^2 A}{1-\cos A}$.

Previously asked in: 2023 30/6/1 Q30

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q47. § 8.5 Summary

[3]

Prove that :

$$\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = 1 + \sec A \operatorname{cosec} A$$

Previously asked in: 2024 30/5/1 Q29

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q48. § Introduction to Trigonometry (Chapter Header and Quote) § 8.5 Summary

[1]

If $\sec \theta - \tan \theta = m$, then the value of $\sec \theta + \tan \theta$ is :

- (a) $1 - \frac{1}{m}$
 (b) $m^2 - 1$
 (c) $\frac{1}{m}$
 (d) $-m$

Previously asked in: 2024 30/1/1 Q7

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q49. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

If $A = 60^\circ$ and $B = 30^\circ$, verify that : $\sin(A + B) = \sin A \cos B + \cos A \sin B$

Previously asked in: 2024 30/1/1 Q23(B)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles 8.4 Trigonometric Identities

Q50. § 8.5 Summary**[3]**

Prove that : $\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = 1 + \sec \theta \operatorname{cosec} \theta$

Previously asked in: 2024 30/1/1 Q28

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q51. § 8.5 Summary**[2]**

If $\cos A + \cos^2 A = 1$, then find the value of $\sin^2 A + \sin^4 A$.

Previously asked in: 2023 30/2/1 Q22(b) (OR-2)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q52. § 8.5 Summary**[1]**

$\sec \theta$ when expressed in terms of $\cot \theta$, is equal to :

- (a) $\frac{\sqrt{1 + \cot^2 \theta}}{\cot \theta}$
 (b) $\sqrt{1 + \cot^2 \theta}$
 (c) $\frac{\sqrt{1 + \cot^2 \theta}}{\cot \theta}$
 (d) $\frac{\sqrt{1 - \cot^2 \theta}}{\cot \theta}$

Previously asked in: 2023 30/4/1 Q10

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q53. § 8.3 Trigonometric Ratios of Some Specific Angles**[2]**

Evaluate $\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$

Previously asked in: 2023 30/4/1 Q25(A) (OR-1)

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

8.4 Trigonometric Identities

Q54. § 8.5 Summary**[3]**

Prove that $\frac{\sin A - 2 \sin^3 A}{2 \cos^3 A - \cos A} = \tan A$

Previously asked in: 2023 30/4/1 Q29(A) (OR-1)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q55. § 8.5 Summary**[3]**

Prove that $\sec A(1 - \sin A)(\sec A + \tan A) = 1$.

Previously asked in: 2023 30/4/1 Q29(B) (OR-2)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q56. § 8.4 Trigonometric Identities**[2]**

If $a \cos \theta + b \sin \theta = m$ and $a \sin \theta - b \cos \theta = n$, then prove that $a^2 + b^2 = m^2 + n^2$.

Previously asked in: 2023 30/5/1 Q25 (OR-1)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q57. § 8.5 Summary

[2]

Prove that :

$$\sqrt{\frac{\sec A - 1}{\sec A + 1}} + \sqrt{\frac{\sec A + 1}{\sec A - 1}} = 2 \operatorname{cosec} A$$

Previously asked in: 2023 30/5/1 Q25 (OR-2)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q58. § 8.5 Summary

[1]

 $\frac{1 - \tan^2 A}{1 - \cot^2 A}$ equals to:
A $\tan^2 A$ B -1 C $-\tan^2 A$ D $\cot^2 A$

Previously asked in: 2026 30/4/1 Q12

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q59. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

Given that $\sin \theta = \frac{a}{b}$, then $\cos \theta$ is equal to :(a) $\frac{b}{\sqrt{b^2 - a^2}}$ (b) $\frac{b}{a}$ (c) $\frac{\sqrt{b^2 - a^2}}{b}$ (d) $\frac{a}{\sqrt{b^2 - a^2}}$

Previously asked in: 2026 30/1/1 Q9

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q60. § 8.5 Summary

[1]

If $\cos A = \frac{1}{2}$, then the value of $\sin^2 A + 2 \cos^2 A$ is :(a) $\frac{3}{2}$ (b) $\frac{5}{4}$ (c) -1 (d) $\frac{1}{2}$

Previously asked in: 2026 30/1/1 Q10

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

8.4 Trigonometric Identities

Q61. § 8.2 Trigonometric Ratios § 8.5 Summary

[2]

Prove that: $\sqrt{\frac{1 + \sin A}{1 - \sin A}} = \sec A + \tan A$

Previously asked in: 2026 30/4/1 Q23 (OR-1)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q62. § 8.5 Summary**[3]**

Prove that: $\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \frac{1}{\sec \theta - \tan \theta}$

Previously asked in: 2026 30/4/1 Q28; 2026 30/5/1 Q28; 2025 30/1/1 Q27 (OR-1); 2025 30/2/1 Q27 (OR-1); 2024 30/2/1 Q29; 2024 30/4/1 Q26; 2023 30/2/1 Q27; 2023 30/5/1 Q30; 2023 30/1/1 Q30 – 9×

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q63. § Introduction to Trigonometry (Chapter Header and Quote) § 8.5 Summary**[2]**

If $\cot \theta = \frac{7}{8}$, then find the value of $\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)}$.

Previously asked in: 2026 30/1/1 Q24(B)

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q64. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.4 Trigonometric Identities § 8.5 Summary**[3]**

If $x = h + a \cos \theta$, $y = k + b \sin \theta$, then prove that: $\left(\frac{x-h}{a}\right)^2 + \left(\frac{y-k}{b}\right)^2 = 1$

Previously asked in: 2026 30/1/1 Q28(A)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q65. § 8.5 Summary**[3]**

Prove that: $\frac{\tan A}{1+\sec A} - \frac{\tan A}{1-\sec A} = 2 \operatorname{cosec} A$

Previously asked in: 2026 30/1/1 Q28(B)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q66. § 8.5 Summary**[1]**

If $2 \sin A = 1$, then the value of $\tan A + \cot A$ is:

- A $\sqrt{3}$
 B $\frac{4}{\sqrt{3}}$
 C $\frac{\sqrt{3}}{2}$
 D 1

Previously asked in: 2026 30/2/1 Q11

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

8.4 Trigonometric Identities

Q67. § 8.5 Summary**[2]**

If $\tan \theta + \frac{1}{\tan \theta} = 2$, find the value of $\tan^2 \theta + \frac{1}{\tan^2 \theta}$.

Previously asked in: 2026 30/2/1 Q24(a)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q68. § 8.2 Trigonometric Ratios § 8.5 Summary**[2]**

Prove that: $\sqrt{\frac{1-\sin \theta}{1+\sin \theta}} = \sec \theta - \tan \theta$

Previously asked in: 2026 30/2/1 Q24(b)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q69. § 8.3 Trigonometric Ratios of Some Specific Angles**[2]**Evaluate: $\frac{\sin^2 30^\circ + \cos^2 60^\circ}{1 + \tan^2 45^\circ}$

Previously asked in: 2025 30/1/1 Q21 (OR-2)

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

8.4 Trigonometric Identities

Q70. § 8.4 Trigonometric Identities**[3]**Prove that: $\frac{\sec^3 \theta}{\sec^2 \theta - 1} + \frac{\csc^3 \theta}{\csc^2 \theta - 1} = \sec \theta \cdot \csc \theta (\sec \theta + \csc \theta)$

Previously asked in: 2026 30/2/1 Q28(a)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q71. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.4 Trigonometric Identities**[3]**If $\frac{\sec \alpha}{\csc \beta} = p$ and $\frac{\tan \alpha}{\csc \beta} = q$, then prove that $(p^2 - q^2) \sec^2 \alpha = p^2$.

Previously asked in: 2026 30/2/1 Q28(b)

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q72. § 8.2 Trigonometric Ratios § 8.4 Trigonometric Identities**[3]**Prove that: $\frac{\sin \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = \frac{2}{\sin \theta}$

Previously asked in: 2025 30/1/1 Q27 (OR-2)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q73. § Introduction to Trigonometry (Chapter Header and Quote)**[1]**If $7 \cos^2 \theta + 3 \sin^2 \theta = 4$, then the value of θ is :

- A 30°
 B 45°
 C 60°
 D 90°

Previously asked in: 2025 30/2/1 Q1

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

8.4 Trigonometric Identities

Q74. § 8.5 Summary**[3]**If $\sin \theta + \cos \theta = \sqrt{3}$, then prove that $\tan \theta + \cot \theta = 1$.

Previously asked in: 2026 30/3/1 Q26(a)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q75. § 8.4 Trigonometric Identities § 8.5 Summary**[3]**Prove that: $(\sin A + \sec A)^2 + (\cos A + \csc A)^2 = (1 + \sec A \csc A)^2$.

Previously asked in: 2026 30/3/1 Q26(b)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q76. § 8.4 Trigonometric Identities § 8.5 Summary**[3]**Prove that: $\frac{\operatorname{cosec} \theta}{\operatorname{cosec} \theta - 1} + \frac{\operatorname{cosec} \theta}{\operatorname{cosec} \theta + 1} = 2 \sec^2 \theta$

Previously asked in: 2025 30/2/1 Q27 (OR-2)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q77. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary

[1]

If $\tan 3\theta = \cot \theta$, then θ equals:

- A 60°
- B 30°
- C 20°
- D 10°

Previously asked in: 2025 30/3/1 Q1

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q78. § 8.4 Trigonometric Identities § 8.5 Summary

[1]

 $(\cot \theta + \tan \theta)$ equals:

- A $\operatorname{cosec} \theta \cdot \sec \theta$
- B $\sin \theta \cdot \sec \theta$
- C $\cos \theta \cdot \tan \theta$
- D $\sin \theta \cdot \cos \theta$

Previously asked in: 2025 30/3/1 Q9

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q79. § 8.5 Summary

[2]

Find the value of x for which $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = x + \tan^2 A + \cot^2 A$

Previously asked in: 2025 30/4/1 Q24(A)

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q80. § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

Evaluate the following : $\frac{3 \sin 30^\circ - 4 \sin^3 30^\circ}{2 \sin^2 50^\circ + 2 \cos^2 50^\circ}$

Previously asked in: 2025 30/4/1 Q24(B)

♦ Introduction to Trigonometry 8.3 Trigonometric Ratios of Some Specific Angles 8.4 Trigonometric Identities

Q81. § 8.5 Summary

[3]

Prove that $\frac{\cos A + \sin A - 1}{\cos A - \sin A + 1} = \operatorname{cosec} A - \cot A$

Previously asked in: 2025 30/4/1 Q29(A)

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q82. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.4 Trigonometric Identities

[3]

If $\cot \theta + \cos \theta = p$ and $\cot \theta - \cos \theta = q$, prove that $p^2 - q^2 = 4\sqrt{pq}$

Previously asked in: 2025 30/4/1 Q29(B)

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q83. § 8.4 Trigonometric Identities § 8.5 Summary

[3]

Prove that: $\frac{\sin A - 2 \sin^3 A}{2 \cos^3 A - \cos A} + \frac{\cos A}{\sin A} = 2 \operatorname{cosec} A$

Previously asked in: 2025 30/3/1 Q28 (OR-1)

♦ Introduction to Trigonometry 8.4 Trigonometric Identities

Q84. § 8.5 Summary**[3]**

Prove that: $\frac{\operatorname{cosec} A}{\operatorname{cosec} A - 1} + \frac{\operatorname{cosec} A}{\operatorname{cosec} A + 1} = 2 \sec^2 A$

Previously asked in: 2025 30/3/1 Q28 (OR-2)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q85. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary**[1]**

$\frac{1 - \tan^2 30^\circ}{1 + \tan^2 30^\circ}$ is equal to

A $\sin 60^\circ$ B $\cos 60^\circ$ C $\tan 60^\circ$ D $\sec 60^\circ$

Previously asked in: 2025 30/5/1 Q12

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

8.4 Trigonometric Identities

Q86. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary**[1]**

Directions: A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. Assertion

(A): For an acute angle θ , $\sin \theta = \frac{3}{5} \Rightarrow \cos \theta = -\frac{4}{5}$. Reason (R): For any value of θ , ($0^\circ \leq \theta \leq 90^\circ$), $\sin^2 \theta + \cos^2 \theta = 1$.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2025 30/5/1 Q19

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q87. § 8.5 Summary**[2]**

If $\sin A = y$, then express $\cos A$ and $\tan A$ in terms of y .

Previously asked in: 2025 30/5/1 Q23(b)

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q88. § 8.3 Trigonometric Ratios of Some Specific Angles § 8.5 Summary**[1]**

Directions: In Question 19 and 20, Assertion (A) and Reason (R) are given. Select the correct option.

****Assertion (A):**** If $\sin A = \frac{1}{3}$ ($0^\circ < A < 90^\circ$), then the value of $\cos A$ is $\frac{2\sqrt{2}}{3}$.

****Reason (R):**** For every angle θ , $\sin^2 \theta + \cos^2 \theta = 1$.

(A) Both Assertion (A) and Reason (R) are true. Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true. Reason (R) does not give correct explanation of (A).

(C) Assertion (A) is true but Reason (R) is not true.

(D) Assertion (A) is not true but Reason (R) is true.

Previously asked in: 2024 30/2/1 Q19

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q89. § 8.5 Summary**[3]**Prove the following trigonometric identity : $\frac{1+\operatorname{cosec} A}{\operatorname{cosec} A} = \frac{\cos^2 A}{1-\sin A}$

Previously asked in: 2025 30/5/1 Q30(a)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q90. § 8.5 Summary**[1]**If $\cos \theta = \frac{\sqrt{3}}{2}$ and $\sin \phi = \frac{1}{2}$, then $\tan(\theta + \phi)$ is :A $\sqrt{3}$ B $\frac{1}{\sqrt{3}}$

C 1

D not defined

Previously asked in: 2024 30/3/1 Q8

♦ Introduction to Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

8.4 Trigonometric Identities

Q91. § 8.4 Trigonometric Identities**[2]**If $a \sec \theta + b \tan \theta = m$ and $b \sec \theta + a \tan \theta = n$, prove that $a^2 + n^2 = b^2 + m^2$

Previously asked in: 2025 30/6/1 Q22(a)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q92. § 8.5 Summary**[2]**Use the identity: $\sin^2 A + \cos^2 A = 1$ to prove that $\tan^2 A + 1 = \sec^2 A$. Hence, find the value of $\tan A$, when $\sec A = \frac{5}{3}$, where A is an acute angle.

Previously asked in: 2025 30/6/1 Q22(b)

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q93.**[3]**Prove that: $\frac{\cos \theta - 2 \cos^3 \theta}{\sin \theta - 2 \sin^3 \theta} + \cot \theta = 0$.

Previously asked in: 2025 30/6/1 Q30(a)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q94. § 8.4 Trigonometric Identities**[3]**Given that $\sin \theta + \cos \theta = x$, prove that $\sin^4 \theta + \cos^4 \theta = \frac{2-(x^2-1)^2}{2}$.

Previously asked in: 2025 30/6/1 Q30(b)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q95.**[3]**Prove that $\frac{\sin \theta - 2 \sin^3 \theta}{2 \cos^3 \theta - \cos \theta} = \tan \theta$.

Previously asked in: 2024 30/3/1 Q30

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q96. § 8.5 Summary

[1]

If $2 \tan A = 3$, then the value of $\frac{4 \sin A + 3 \cos A}{4 \sin A - 3 \cos A}$ is

A $\frac{7}{\sqrt{13}}$

B $\frac{1}{\sqrt{13}}$

C 3

D does not exist

Previously asked in: 2023 30/1/1 Q6

♦ Introduction to Trigonometry

8.2 Trigonometric Ratios

8.4 Trigonometric Identities

Q97. § Introduction to Trigonometry (Chapter Header and Quote) § 8.3 Trigonometric Ratios of Some Specific Angles

[2]

If $\sin \theta + \cos \theta = \sqrt{3}$, then find the value of $\sin \theta \cdot \cos \theta$.

Previously asked in: 2023 30/1/1 Q23(a) (OR-1)

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q98.

[1]

$\frac{\cos^2 \theta}{\sin^2 \theta} - \frac{1}{\sin^2 \theta}$, in simplified form, is :

A $\tan^2 \theta$

B $\sec^2 \theta$

C 1

D -1

Previously asked in: 2023 30/6/1 Q7

♦ Introduction to Trigonometry

8.4 Trigonometric Identities

Q99. § 9.2 Summary

[4]

From the top of an 8 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower. (Take $\sqrt{3} = 1.732$).

Previously asked in: 2022 30/4/1 Q12

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q100. § 9.1 Heights and Distances § 9.2 Summary

[2]

The angle of elevation of the top of a tower from a point on the ground which is 30 m away from the foot of the tower, is 30° . Find the height of the tower.

Previously asked in: 2023 30/2/1 Q24(b) (OR-2)

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q101. § 9.1 Heights and Distances § 9.2 Summary

[5]

As observed from the top of a 75 m high lighthouse from the sea-level, the angles of depression of two ships are 30° and 60° . If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships. (Use $\sqrt{3} = 1.73$)

Previously asked in: 2023 30/2/1 Q33(a) (OR-1)

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Angles of Depression – Two Ships/Objects from a Lighthouse

Q102. § 9.1 Heights and Distances § 9.2 Summary

[5]

From a point on the ground, the angle of elevation of the bottom and top of a transmission tower fixed at the top of 30 m high building are 30° and 60° , respectively. Find the height of the transmission tower. (Use $\sqrt{3} = 1.73$)

Previously asked in: 2023 30/2/1 Q33(b) (OR-2)

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q103. § 9.1 Heights and Distances § 9.2 Summary

[5]

One observer estimates the angle of elevation to the basket of a hot air balloon to be 60° , while another observer 100 m away estimates the angle of elevation to be 30° . Find :

- (a) The height of the basket from the ground.
- (b) The distance of the basket from the first observer's eye.
- (c) The horizontal distance of the second observer from the basket.

Previously asked in: 2023 30/5/1 Q32

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q104. § 9.1 Heights and Distances § 9.2 Summary

[3]

The tops of two poles of heights 20 m and 28 m are connected with a wire. The wire is inclined to the horizontal at an angle of 30° . Find the length of the wire and the distance between the two poles.

Previously asked in: 2022 30/3/1 Q8

♦ Some Applications of Trigonometry

8.2 Trigonometric Ratios

8.3 Trigonometric Ratios of Some Specific Angles

Q105. § 9.1 Heights and Distances § 9.2 Summary

[1]

From a point on the ground, which is 60 m away from the foot of a vertical tower, the angle of elevation of the top of the tower is found to be 45° . The height (in metres) of the tower is :

- A $10\sqrt{3}$
- B $30\sqrt{3}$
- C 60
- D 30

Previously asked in: 2026 30/2/1 Q12

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q106. § 9.1 Heights and Distances § 9.2 Summary

[4]

Amrita stood near the base of a lighthouse, gazing up at its towering height. She measured the angle of elevation to the top and found it to be 60° . Then, she climbed a nearby observation deck, 40 metres higher than her original position and noticed the angle of elevation to the top of lighthouse to be 45° .

Based on the above given information, answer the following questions:

- (i) Find CD in terms of h (where h is the height). [1]
- (ii) Find BD in terms of BC . [1]
- (iii) Find the height CE of the lighthouse. [Use $\sqrt{3} = 1.73$] [2]

Previously asked in: 2025 30/1/1 Q38

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q107. § 9.1 Heights and Distances § 9.2 Summary**[5]**

A boy standing on a horizontal plane is flying a kite with a string of length 60 m, at an angle of elevation of 30° . Another boy standing on the roof of a 20 m high building, finds the angle of elevation of same kite to be 45° . If both the boys are on opposite sides of the kite, find the distance of the first boy from the base of the building. Also, find the height of the kite from the ground. (Use $\sqrt{3} = 1.73$)

Previously asked in: 2026 30/3/1 Q35

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q108. § 9.2 Summary**[5]**

The angles of depression of the top and the bottom of an 8 m tall building from the top of another multistoried building are 30° and 45° , respectively. Find the height of the multistoried building and the distance between the two buildings.

Previously asked in: 2025 30/2/1 Q32 (OR-2)

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q109. § 9.1 Heights and Distances § 9.2 Summary**[1]**

Assertion (A): A ladder leaning against a wall, stands at a horizontal distance of 6 m from the wall. If the height of the wall up to which the ladder reaches is 8 m, then the length of the ladder is 10 m.

Reason (R): The ladder makes an angle of 60° with the ground.

Select the correct answer from the codes (A), (B), (C) and (D) given below:

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2025 30/3/1 Q19

♦ Some Applications of Trigonometry

8.2 Trigonometric Ratios

9.1 Heights and Distances

Q110. § 9.1 Heights and Distances § 9.2 Summary**[4]**

A lighthouse stands tall on a cliff by the sea, watching over ships that pass by. One day a ship is seen approaching the shore and from the top of the lighthouse, the angles of depression of the ship are observed to be 30° and 45° as it moves from point P to point Q. The height of the lighthouse is 50 metres.

Based on the information given above, answer the following questions:

(i) Find the distance of the ship from the base of the lighthouse when it is at point Q, where the angle of depression is 45° . [1]

(ii) Find the measures of $\angle PBA$ and $\angle QBA$. [1]

(iii) Find the distance travelled by the ship or the speed of the ship. [2]

Previously asked in: 2025 30/3/1 Q37

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

Angle of Depression from top of lighthouse/tower to a moving object

Distance travelled by a moving ship using two angles of depression

Q111. § 9.2 Summary

[5]

From the top of a 45 m high light house, the angles of depression of two ships, on the opposite side of it, are observed to be 30° and 60° . If the line joining the ships passes through the foot of the light house, find the distance between the ships. (Use $\sqrt{3} = 1.73$)

Previously asked in: 2024 30/2/1 Q34

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q112. § 9.1 Heights and Distances § 9.2 Summary

[1]

From a point on the ground, which is 30 m away from the foot of a vertical tower, the angle of elevation of the top of the tower is found to be 60° . The height (in metres) of the tower is :

- A $10\sqrt{3}$
- B $30\sqrt{3}$
- C 60
- D 30

Previously asked in: 2024 30/3/1 Q7

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q113. § 9.1 Heights and Distances § 9.2 Summary

[5]

From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower.

Previously asked in: 2024 30/3/1 Q34

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q114. § 9.1 Heights and Distances § 9.2 Summary

[1]

At some time of the day, the length of the shadow of a tower is equal to its height. Then, the Sun's altitude at that time is :

- A 30°
- B 45°
- C 60°
- D 90°

Previously asked in: 2024 30/4/1 Q14

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Q115. § 9.1 Heights and Distances § 9.2 Summary

[5]

The angle of elevation of the top of a tower 24 m high from the foot of another tower in the same plane is 60° . The angle of elevation of the top of second tower from the foot of the first tower is 30° . Find the distance between two towers and the height of the other tower. Also, find the length of the wire attached to the tops of both the towers.

Previously asked in: 2023 30/1/1 Q33(a) (OR-1)

♦ Some Applications of Trigonometry

8.3 Trigonometric Ratios of Some Specific Angles

9.1 Heights and Distances

Length of wire between tops of two towers (Pythagoras / distance formula in context)

Q116. § 10.4 Summary

[2]

If two tangents inclined at an angle of 60° are drawn to a circle of radius 3 cm, then find the length of each tangent.

Previously asked in: 2024 30/5/1 Q21(a) (OR-1)

♦ Circles

10.2 Tangent to a Circle

10.3 Number of Tangents from a Point on a Circle

8.3 Trigonometric Ratios of Some Specific Angles

Q117. § 10.2 Tangent to a Circle § 10.4 Summary**[1]**

In the given figure, AB is a tangent to the circle centered at O . If $OA = 6$ cm and $\angle OAB = 30^\circ$, then the radius of the circle is :

- (a) 3 cm
- (b) $3\sqrt{3}$ cm
- (c) 2 cm
- (d) $\sqrt{3}$ cm

Previously asked in: 2023 30/5/1 Q11

◆ Circles 10.2 Tangent to a Circle 8.3 Trigonometric Ratios of Some Specific Angles

Q118. § 10.2 Tangent to a Circle § 10.4 Summary**[1]**

In the given figure, PQ and PR are tangents to a circle with centre O and radius 3 cm. If $\angle QPR = 60^\circ$, then the length of each tangent is :

- A $3\sqrt{3}$ cm
- B 3 cm
- C 6 cm
- D $\sqrt{3}$ cm

Previously asked in: 2026 30/3/1 Q2

◆ Circles 10.2 Tangent to a Circle 10.3 Number of Tangents from a Point on a Circle 8.3 Trigonometric Ratios of Some Specific Angles

Q119. § 10.1 Introduction § 10.2 Tangent to a Circle § 10.4 Summary**[3]**

In the adjoining figure, TP and TQ are tangents drawn to a circle with centre O . If $\angle OPQ = 15^\circ$ and $\angle PTQ = \theta$, then find the value of $\sin 2\theta$.

Previously asked in: 2025 30/6/1 Q31

◆ Circles 10.2 Tangent to a Circle 10.3 Number of Tangents from a Point on a Circle 8.3 Trigonometric Ratios of Some Specific Angles

Q120. § 11.1 Areas of Sector and Segment of a Circle**[3]**

In the given figure, chord AB subtends an angle of 120° at the centre of the circle with radius 7 cm. Find (i) perimeter of major sector $OACB$, and (ii) area of the shaded segment, if area of $\triangle OAB = 21 \cdot 2 \text{ cm}^2$.

Previously asked in: 2026 30/3/1 Q27

◆ Areas Related to Circles 11.1 Areas of Sector and Segment of a Circle 8.3 Trigonometric Ratios of Some Specific Angles

Q121. § 11.2 Summary**[4]**

Anurag purchased a farmhouse which is in the form of a semicircle of diameter 70 m. He divides it into three parts by taking a point P on the semicircle in such a way that $\angle PAB = 30^\circ$ as shown in the following figure, where O is the centre of semicircle. In part I, he planted saplings of Mango tree, in part II, he grew tomatoes and in part III, he grew oranges.

Based on given information, answer the following questions.

- (i) What is the measure of $\angle POA$? [1]
- (ii) Find the length of wire needed to fence entire piece of land. [1]
- (iii) Find the area of region in which saplings of Mango tree are planted. [2]

Previously asked in: 2025 30/6/1 Q36

◆ Areas Related to Circles 11.1 Areas of Sector and Segment of a Circle 8.3 Trigonometric Ratios of Some Specific Angles

Q122. § 11.2 Summary**[5]**

A chord of a circle of radius 14 cm subtends an angle of 60° at the centre. Find the area of the corresponding minor segment of the circle. Also find the area of the major segment of the circle.

Previously asked in: 2023 30/1/1 Q34

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

8.3 Trigonometric Ratios of Some Specific Angles

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