Important Questions for Class 11 Maths Chapter 3: Important Questions for Class 11 Maths Chapter 3 Trigonometric Functions are created to help students grasp the core concepts of trigonometry which is important for advanced mathematical problem-solving.

Solving these questions helps students build a strong foundation in trigonometry, making it easier to tackle more complex questions in exams and other mathematical applications. By working through these problems, students can reinforce their knowledge enhance their problem-solving skills and gain confidence in approaching this critical chapter.

Important Questions for Class 11 Maths Chapter 3 Overview

Important Questions for Class 11 Maths Chapter 3 Trigonometric Functions have been created by subject experts at Physics Wallah to provide students with a deep understanding of trigonometry's fundamental concepts.

Each question has been chosen to align with the curriculum, helping students practice problem-solving techniques and understand how to approach different types of trigonometric problems effectively. Practicing these expert-prepared questions enables students to strengthen their foundational knowledge and boost their confidence for exams.

Important Questions for Class 11 Maths Chapter 3 PDF

Important Questions for Class 11 Maths Chapter 3 Trigonometric Functions PDF is available below for download.

By using this PDF students can easily access the most relevant questions for practice and exam preparation, helping them enhance their understanding of trigonometry and improve problem-solving skills. Download the PDF to get started with your preparation.

Important Questions for Class 11 Maths Chapter 3 PDF

Important Questions For Class 11 Maths Chapter 3 Trigonometric Functions

Here is the Important Questions For Class 11 Maths Chapter 3 Trigonometric Functions-

Q. No.1: In any triangle ABC, prove that a sin (B – C) + b sin (C – A) + c sin (A – B) = 0.

Solution:

In any triangle ABC,

a/sin A = b/sin B = c/sin C = k

a = k sin A, b = k sin B, c = k sin C

LHS

= a sin (B – C) + b sin (C – A) + c sin (A – B)

= k sin A [sin B cos C – cos B sin C] + k sin B [sin C cos A – cos C sin A] + k sin C [sin A cos B – cos A sin B]

= k sin A sin B cos C – k sin A cos B sin C + k sin B sin C cos A – k sin B cos C sin A + k sin C sin A cos B – k sin C cos A sin B

= 0

= RHS

Hence proved that a sin (B – C) + b sin (C – A) + c sin (A – B) = 0.

Q.No.2: Find the radius of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm (use π = 22/7).

Solution:

Given,

Length of the arc = l = 37.4 cm

Central angle = θ = 60° = 60π/180 radian = π/3 radians

We know that,

r = l/θ

= (37.4) * (π / 3)

= (37.4) / [22 / 7 * 3]

= 35.7 cm

Hence, the radius of the circle is 35.7 cm.

Q. No.3: A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?

Solution:

Given,

Number of revolutions made by the wheel in 1 minute = 360

1 minute = 60 seconds

Number of revolutions in 1 second = 360/60 = 6

Angle made in 1 revolution = 360°

Angles made in 6 revolutions = 6 × 360°

Radian measure of the angle in 6 revolutions = 6 × 360 × π/180

= 6 × 2 × π

= 12π

Hence, the wheel turns 12π radians in one second.

Q. No. 4: Find the value of √3 cosec 20° – sec 20°.

Solution:

√3 cosec 20° – sec 20°

$$= \frac{\sqrt{3}}{\sin 20^\circ} - \frac{1}{\cos 20^\circ}$$

$$= \frac{\sqrt{3}\cos 20^\circ - \sin 20^\circ}{\sin 20^\circ \cos 20^\circ} = 4\left(\frac{\frac{\sqrt{3}}{2}\cos 20^\circ - \frac{1}{2}\sin 20^\circ}{2\sin 20^\circ \cos 20^\circ}\right)$$

$$= 4\left(\frac{\sin 60^\circ \cos 20^\circ - \cos 60^\circ \sin 20^\circ}{\sin 40^\circ}\right)$$

$$= 4\left(\frac{\sin (60^\circ - 20^\circ)}{\sin 40^\circ}\right) = 4$$

Q. No. 5: Show that tan 3x tan 2x tan x = tan 3x – tan 2x – tan x.

Solution:

Let 3x = 2x + x

Taking “tan” on both sides,

tan 3x = tan (2x + x)

We know that,

$$\tan(x + y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}$$

tan 3x = (tan 2x + tan x)/ (1- tan 2x tan x)

tan 3x(1 – tan 2x tan x) = tan 2x + tan x

tan 3x – tan 3x tan 2x tan x = tan 2x + tan x

tan 3x – (tan 2x + tan x) = tan 3x tan 2x tan x

Therefore, tan 3x – tan 2x – tan x = tan 3x tan 2x tan x.

Q. No. 6: Prove that:

$$\cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right) = \frac{3}{2}$$

Solution:

LHS

$= \cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right)$

$= \cos^2 x + [\cos(x + \frac{\pi}{3})]^2 + [\cos(x - \frac{\pi}{3})]^2$

$= \cos^2 x + (\cos x\ cos\frac{\pi}{3} - \sin x \sin\frac{\pi}{3})^2 + (\cos x\ cos\frac{\pi}{3} + \sin x \sin\frac{\pi}{3})^2$

$= \cos^2 x + [\cos x\ \left(\frac{1}{2}\right) - \sin x\ (\frac{\sqrt{3}}{2})]^2 + [\cos x\ \left(\frac{1}{2}\right) + \sin x\ (\frac{\sqrt{3}}{2})]^2$

$= \cos^2 x + \frac{1}{4}(\cos x - \sqrt{3}\sin x)^2 + \frac{1}{4}(\cos x + \sqrt{3}\sin x)^2$

$= \cos^2 x + \frac{1}{4}(\cos^2 x + 3\sin^2 x - 2\sqrt{3}\cos x \sin x) + \frac{1}{4}(\cos^2 x + 3\sin^2 x + 2\sqrt{3}\cos x \sin x)$

$= \cos^2 x + \frac{1}{4}(\cos^2 x + 3\sin^2 x - 2\sqrt{3}\cos x \sin x + \cos^2 x + 3\sin^2 x + 2\sqrt{3}\cos x \sin x)$

$= \cos^2 x + \frac{1}{4}(2\cos^2 x + 6\sin^2 x)$

$= \cos^2 x + \frac{1}{2}\cos^2 x + \frac{3}{2}\sin^2 x$

$= \frac{3}{2}\cos^2 x + \frac{3}{2}\sin^2 x$

$= \frac{3}{2}(\cos^2 x + \sin^2 x)$

$= \frac{3}{2}(1)$

$= \frac{3}{2}$

= RHS

Hence proved.

Q. No. 7: Find the value of cos 570° sin 510° + sin (-330°) cos (-390°).

Solution:

LHS =cos (570)sin (510) + sin (- 330)cos (- 390)

= cos (570) sin (510) + [– sin (330)]cos (390) [because sin(– x) = – sin x and cos(– x) = cos x]

= cos (570)sin(510) – sin (330)

= cos (90 * 6 + 30) sin (90 * 5 + 60) – sin (90 * 3 + 60) cos (90 * 4 + 30)

= – cos (30) cos (60) – [– cos (60)] cos (30)

= – cos (30) cos (60) + cos (30) sin (60)

= 0

Q. No. 8: Find the general solution of the following equation.

$$\cot^2\theta + \frac{3}{\sin\theta} + 3 = 0$$

Solution:

Given,

$$\cot^2\theta + \frac{3}{\sin\theta} + 3 = 0$$

$$\frac{\cos^2\theta}{\sin^2\theta} + \frac{3}{\sin\theta} + 3 = 0$$

$\cos^2\theta + 3\sin\theta + 3\sin^2\theta = 0$

$1 - \sin^2\theta + 3\sin\theta + 3\sin^2\theta = 0$

$2\sin^2\theta + 3\sin\theta + 1 = 0$

$2\sin^2\theta + 2\sin\theta + \sin\theta + 1 = 0$

$2\sin\theta(\sin\theta + 1) + 1(\sin\theta + 1) = 0$

$(2\sin\theta + 1)(\sin\theta + 1) = 0$

$2\sin\theta + 1 = 0$, $\sin\theta + 1 = 0$

$\sin\theta = -½$, $\sin\theta = -1$

$\theta = n\pi - (-1)^n \pi/6$, $\theta = n\pi - (-1)^n \pi/2$; $n \in Z$

Q. No. 9: Show that $2\sin^2\beta + 4\cos(\alpha + \beta)\sin\alpha\sin\beta + \cos 2(\alpha + \beta) = \cos 2\alpha$.

Solution:

LHS = $2\sin^2\beta + 4\cos(\alpha + \beta)\sin\alpha\sin\beta + \cos 2(\alpha + \beta)$

= $2\sin^2\beta + 4(\cos\alpha\cos\beta - \sin\alpha\sin\beta)\sin\alpha\sin\beta + (\cos 2\alpha\cos 2\beta - \sin 2\alpha\sin 2\beta)$

$= 2 \sin^2\beta + 4 \sin \alpha \cos \alpha \sin \beta \cos \beta - 4 \sin^2\alpha \sin^2\beta + \cos 2\alpha \cos 2\beta - \sin 2\alpha \sin 2\beta$

$= 2 \sin^2\beta + \sin 2\alpha \sin 2\beta - 4 \sin^2\alpha \sin^2\beta + \cos 2\alpha \cos 2\beta - \sin 2\alpha \sin 2\beta$

$= (1 - \cos 2\beta) - (2 \sin^2\alpha) (2 \sin^2\beta) + \cos 2\alpha \cos 2\beta$

$= (1 - \cos 2\beta) - (1 - \cos 2\alpha) (1 - \cos 2\beta) + \cos 2\alpha \cos 2\beta$

$= \cos 2\alpha$

= RHS

Therefore, $2 \sin^2\beta + 4 \cos (\alpha + \beta) \sin \alpha \sin \beta + \cos 2 (\alpha + \beta) = \cos 2\alpha$

Q. No. 10: Prove that:

$$\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$$

Solution:

LHS=$(\sec 8\theta -1)/ (\sec 4\theta -1)$

$=(1/(\cos 8\theta) -1)/ (1/(\cos 4\theta) -1)$

$=((1-\cos 8\theta)\cos 4\theta)/ ((1-\cos 4\theta) \cos 8\theta)$

$=(2\sin^2 4\theta \cos 4\theta)/ ((2\sin^2 2\theta) \cos 8\theta)$

$=(2\sin 4\theta \cos 4\theta \sin 4\theta)/ ((2\sin^2 2\theta) \cos 8\theta)$

$=(\sin 8\theta * 2\sin 2\theta \cos 2\theta)/ ((2\sin^2 2\theta) \cos 8\theta)$

$=(\tan 8\theta * \cos 2\theta)/ (\sin 2\theta)$

$= (\tan 8\theta) /(\tan 2\theta)$

= RHS

Hence proved.

Benefits of Solving Important Questions For Class 11 Maths Chapter 3 Trigonometric Functions

Solving Important Questions for Class 11 Maths Chapter 3 Trigonometric Functions provide several key benefits:

Improved Conceptual Understanding: These questions cover a variety of topics, allowing students to reinforce their understanding of trigonometric functions, identities and equations.

Exam Readiness: Practicing these questions helps familiarize students with the types of problems they may encounter in exams, ensuring they are well-prepared for any question format.

Enhanced Problem-Solving Skills: By tackling diverse problems students develop strong problem-solving abilities which are important for tackling complex mathematical challenges.

Time Management: Regular practice helps students manage time effectively during exams, as they become adept at solving problems more quickly and efficiently.

Confidence Boost: Solving a wide range of questions from the chapter increases confidence in tackling various trigonometric problems, making students more confident when facing their exams.

Better Retention: Frequent practice improves retention and recall of important formulas and concepts which is important for mastering trigonometry.