RS Aggarwal Solutions for Class 10 Maths Chapter 7 Exercise 7.3: The Physics Wallah academic team has produced a comprehensive solution for Chapter 7's Trigonometric Identities in the RS Aggarwal class 10 textbook. Use the NCERT solutions to assist you tackle questions from the NCERT to get good grades in class 10.

Maths class 10 NCERT solutions were uploaded by a Physics Wallah specialist. The RS Aggarwal class 10 solution for Chapter 7 Trigonometric Identities Exercise 7C is uploaded for reference only; do not copy the solutions. Before going through the solution of Chapter 7 Trigonometric Identities Exercise-7C, one must have a clear understanding of Chapter 7 Trigonometric Identities. Read the theory of Chapter 7 Trigonometric Identities and then try to solve all numerical of exercise 7C.

RS Aggarwal Solutions for Class 10 Maths Chapter 7 Exercise 7.3 Overview

RS Aggarwal Solutions for Class 10 Maths Chapter 7 Exercise 7.3 focuses on trigonometric identities. This exercise includes a variety of problems that require students to prove or use different trigonometric identities. The solutions provide step-by-step explanations, helping students understand each concept clearly.

By working through these problems, students can practice applying identities in different scenarios, learn to avoid common mistakes, and build a strong foundation for more advanced math topics. Overall, this exercise is designed to reinforce understanding and improve problem-solving skills in trigonometry.

What are Trigonometric Identities?

Trigonometric identities are equations involving trigonometric functions that are true for all values of the variables within their domains. These identities are fundamental in trigonometry and are used to simplify expressions, solve equations, and prove other mathematical results.

Trigonometric identities are essential tools in mathematics, helping to simplify and solve problems involving trigonometric functions. They also play a crucial role in calculus, physics, engineering, and many other fields where trigonometric concepts are applied.

RS Aggarwal Solutions for Class 10 Maths Chapter 7 Exercise 7.3 Trigonometric Identities

Below we have provided RS Aggarwal Solutions for Class 10 Maths Chapter 7 Trigonometric Identities Exercise 7.3 for the ease of the students –

Question 1

Write the value of $(1 - \sin^2\theta)\sec^2\theta$.

Solution

s we know

$1 - \sin^2 Q = \cos^2 Q$

nd

$\sec^2 Q = \dfrac{1}{\cos^2 Q}$

so

$(1 - \sin^2 Q)\sec^2 Q$
$= \cos^2 Q \times \sec^2 Q$
$= 1$

Question 2

Write the value of $(1 - \cos^2\theta)\operatorname{cosec}^2\theta$.

Solution

s we know

$$1 - \cos^2 Q = \sin^2 Q$$

nd

$$\cosec^2 Q = \frac{1}{\sin^2 Q}$$

so

$$(1 - \cos^2 Q)\cosec^2 Q$$

$$\sin^2 Q \cosec^2 Q = 1$$

Question 3

Write the value of $(1 + \cot^2 \theta) \sin^2 \theta$.

Solution

$(1 + \cot^2 \theta) \sin^2 \theta$
$= \cosec^2 \theta \sin^2 \theta$
$= 1$

Question 4

Write the value of $(\sin^2 \theta + \frac{1}{1 + \tan^2 \theta})$

Solution

$$\left(\sin^2 Q + \frac{1}{1 + \tan^2 Q}\right)$$

$$\left(\sin^2 Q + \frac{1}{\sec^2 Q}\right)$$

$$\sin^2 Q + \cos^2 Q = 1 = \text{ns}$$

Question 5

Write the value of $\sec^2 \theta \ (1 + \sin \theta)(1 - \sin \theta)$.

Solution

$\sec^2 \theta \ (1 + \sin \theta)(1 - \sin \theta)$

$= \sec^2 \theta \ (1 - \sin^2 \theta)$

$= \sec^2 \theta \ \cos^2 \theta$

$= 1$

Question 6

Write the value of $3\cot^2 \theta - 3\csc^2 \theta$

Solution

$3\cot^2 \theta - 3\csc^2 \theta$

$= 3\cot^2 \theta - 3(1 + \cot^2 \theta) \quad [1 + \cot^2 \theta = \csc^2 \theta]$

$= 3\cot^2 \theta - 3 - 3\cot^2 \theta$

$= -3$

Question 7

Write the value of $\dfrac{\tan^2 \theta - \sec^2 \theta}{\cot^2 \theta - \csc^2 \theta}$

Solution

we know th t

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

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

$\dfrac{\tan^2\theta - \sec^2\theta}{\cot^2\theta - \csc^2\theta} = \dfrac{-1}{-1} = 1$

Question 8

If $\cos \theta = \dfrac{7}{25}$ write the value of $(\tan \theta + \cot \theta)$

Solution

$\cos\theta = \dfrac{7}{25}$

we know th t

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

$\dfrac{49}{625} + \sin^2\theta = 1$

$\sin^2\theta = \dfrac{576}{625}$

$\sin\theta = \dfrac{24}{25}$

then

$\tan\theta = \dfrac{\sin\theta}{\cos\theta} = \dfrac{\frac{24}{25}}{\frac{7}{25}} = \dfrac{24}{7}$

so $\cot\theta = \dfrac{7}{24}$

$\tan\theta + \cot\theta = \dfrac{24}{7} + \dfrac{7}{24} = \dfrac{625}{168}$

Question 9

If $\cot A = \dfrac{4}{3}$ and $(A + B) = 90^\circ$, what is the value of $\tan B$?

Solution

s we know

$$cot(A + B) = \frac{1 - tanA\,tanB}{tanA + tanB}$$

so

$$cot(A + B) = \frac{1 - \frac{4}{3} tanB}{\frac{4}{3} + tan\,B} = cot(90) = 0$$

so

$$1 - \frac{4}{3} tanB = 0$$

$$tanB = \frac{3}{4}$$

Question 10

If cos B = $\frac{3}{5}$ and (A + B) = 90°, find the value of sin A.

Solution

Given, A + B = 90°

$\Rightarrow$ B = 90° − A

Now, cosB = $\frac{3}{5}$

$\Rightarrow$ cos(90° − A) = $\frac{3}{5}$

$\Rightarrow$ sinA = $\frac{3}{5}$

Question 11

If $\sqrt{3}$ sin θ = cos θ and θ is an acute angle, find the value of θ.

Solution

given

$$\frac{sinQ}{cosQ} \quad \frac{1}{\sqrt{3}}$$

so

$$tanQ \quad \frac{1}{\sqrt{3}} \quad tan\ 30$$

on comp ring

we c n s y

Q   30

Question 12

Write the value of tan 1° tan 2° ..... tan 89°.

Solution

tan 1°. tan 2°.........tan 89°

but tan 89° can be written as cot 1[tan(90°-1)=cot 1°]\)

by tan (90° – θ) = cot (θ)

Similarly,

tan 88° = cot 2°
tan 87° = cot 3°

.............up to tan 46° = cot 44°

then middle one is tan 45° = 1

So it becomes,

tan 1°. tan 2°...........tan 44°. tan 45°. cot 44°..............cot 1°

tan and cot cancel out by tan θ × cot θ = 1

So,

tan 1°. tan 2°.........tan 89° = tan 1°. tan 2°...........tan 44°. tan 45°. cot 44°.......
= 1 × tan 45°
= 1 × 1
– 1

Answer = 1

Question 13

Write the value of cos 1° cos 2° .... cos 180°.

Solution

cos 90 = 0

so when we'll multiply all the other values with cos 90 it will terminate to 0

cos1.cos2...........cos90.......cos180 =cos1.cos2...........× 0 × cos180

= 0

Question 14

Find the value of sin 48° sec 42° + cos 48° cosec 42°.

Solution

sin 48° sec 42° + cos 48° cosec 42°

$= \sin 48 \times \sec(90 - 48) + \cos 48 \times \mathrm{cosec}(90 - 48)$

$= \sin 48 \times \mathrm{cosec}\, 48 + \cos 48 \times \sec 48$

$= \sin 48 \times \left(\dfrac{1}{\sin 48}\right) + \cos 48 \times \left(\dfrac{1}{\cos 48}\right)$

$= 1 + 1 = 2 = RHS$

Question 15

If sec θ + tan θ = x, find the value of sec θ.

Solution

$\sec \theta + \tan \theta = x \; - - - - (1)$

$\Rightarrow \sec \theta = (x - \tan \theta)$

Squaring both sides, we get,

$\sec^2 \theta = x^2 - 2x \tan \theta + \tan^2 \theta$

$\Rightarrow \sec^2 \theta - \tan^2 \theta = x^2 - 2x \tan \theta$

$\Rightarrow 1 = x^2 - 2x \tan \theta$

$\Rightarrow 2x \tan \theta = x^2 - 1$

$\Rightarrow \tan \theta = \dfrac{x^2 - 1}{2x}$

Put this value in equation (1), we get

$\sec \theta + \dfrac{x^2 - 1}{2x} = x$

$\Rightarrow \sec \theta = \dfrac{x^2 - 1}{2x} - x$

$\Rightarrow \sec \theta = \dfrac{2x^2 - x^2 + 1}{2x}$

$\Rightarrow \sec \theta = \dfrac{x^2 + 1}{2x}$

Benefits of RS Aggarwal Solutions for Class 10 Maths Chapter 7 Exercise 7.3

RS Aggarwal's solutions for Class 10 Maths, including Chapter 7 Exercise 7.3 on Trigonometric Identities, offer several benefits for students. Here's a breakdown of how these solutions can be particularly useful:

1. **Clear Explanations**

Concept Clarity: The solutions provide step-by-step explanations that help clarify complex trigonometric identities. Understanding each step ensures that students grasp the underlying principles.

Simplified Approach: Each solution breaks down the process of proving or using trigonometric identities in a simplified manner, making it easier for students to follow.

2. **Practice and Application**

Variety of Problems: Exercise 7.3 typically contains a range of problems, from basic to more challenging ones. Practicing these problems helps reinforce the concepts and improves problem-solving skills.

Application of Identities: Solutions often demonstrate various ways to apply trigonometric identities, helping students understand their practical uses in different types of problems.

3. **Error Analysis**

Common Mistakes: By following the solutions, students can identify and learn from common mistakes made in solving trigonometric problems. This helps in avoiding these errors in future exercises.

Alternative Methods: Solutions may include alternative methods to solve problems, giving students a broader perspective on how to approach different types of questions.

4. **Exam Preparation**

Concept Reinforcement: Regular practice with these solutions helps in reinforcing the concepts, which is crucial for performing well in exams.

Time Management: By practicing with solutions, students can develop strategies to solve problems more efficiently within the time constraints of an exam.

5. **Self-Assessment**

Immediate Feedback: Students can compare their answers with the provided solutions to self-assess their understanding and identify areas needing improvement.

Confidence Building: Solving exercises correctly with the help of these solutions boosts confidence in handling similar problems independently.

6. **Foundation for Advanced Topics**

Building Blocks: Mastering trigonometric identities in Class 10 sets a strong foundation for more advanced topics in higher classes, such as calculus and complex numbers.

Preparation for Higher Studies: A solid understanding of trigonometric identities is essential for various competitive exams and further studies in mathematics.

7. **Accessibility**

User-Friendly Format: RS Aggarwal's solutions are often well-organized and easy to navigate, which helps students quickly find the help they need.

Visual Learning: Many solutions include diagrams and graphs that aid in visualizing the problems and understanding the concepts better.

8. **Enhanced Learning Tools**

Worked-Out Examples: The book provides worked-out examples that illustrate how to approach and solve problems, which enhances the learning experience.

Summary of Key Points: Important trigonometric identities and formulas are summarized, making it easier for students to review and remember them.