



VIGNAN HIGH SCHOOL

Evaluation Spectrum

Class : Class 9

Subject : IIT Foundation Plus Maths

Chapters : 5 Trigonometry,6 Trigonometric Equations - I,7 Trigonometric Equations - II,8 Properties Of Triangles - I

Exam : IIT / NEET CUMULATIVE TEST - 2 (F - Plus)

Subject Avg : 30

Overall Performance Analysis

Based on the questions provided, here's a detailed evaluation of the student's overall performance:

Strengths:

1. Trigonometric Identities:

- The student demonstrated a solid understanding of trigonometric identities and their relationships, particularly in recognizing the basic identities like $\tan^2(\theta) + 1 = \sec^2(\theta)$ and knowing that $\tan(270^\circ)$ is **undefined**.
- The correct answer to $\tan^2(\theta) + 1 = \sec^2(\theta)$ was chosen, showing strong knowledge of fundamental trigonometric formulas.

2. Basic Function Definitions:

- The student correctly defined $\tan(\theta) = \sin(\theta) / \cos(\theta)$, reflecting a clear understanding of trigonometric functions and their standard definitions.
- The student correctly answered questions about $\sin(180^\circ - x)$ and $\tan(180^\circ + x)$, showing familiarity with periodic properties of trigonometric functions.

3. Solving Simple Equations:

- The student performed well in **solving simple trigonometric equations** like finding the roots of an equation involving sine, showing proficiency in basic algebra and trigonometric manipulation. The answer to the **number of roots of the equation** $2\sin^2(\theta) + 3\sin(\theta) + 1 = 0$ was correct.
- The student correctly interpreted **trigonometric equations** such as $\sin(6\theta) = \sin(4\theta) - \sin(2\theta)$, indicating

a sound grasp of how to simplify and solve more complex expressions.

Weaknesses:

1. Advanced Trigonometric Problem Solving:

- The student struggled with certain **advanced trigonometric identities** and expressions. For instance, there were challenges in solving more intricate problems like the **sum of infinite trigonometric terms** and finding values of x based on infinite series.
- The question about $\sin(6\theta) = \sin(4\theta) - \sin(2\theta)$ seemed difficult for the student, indicating a potential weakness in handling multiple angle identities or transformations.

2. Analytical Geometry and Triangle Properties:

- The student faced difficulties with some questions related to **geometrical properties of triangles** and relationships involving the cotangent function in the context of triangles. The question involving $(b - c) \cot(A/2) =$ was particularly challenging, suggesting a gap in the understanding of triangle-specific formulas.
- The question on the minimum value involving $2a/b + c - a$ also seemed to have been answered incorrectly, which could point to a struggle with optimization problems and more complex algebraic manipulation within geometric contexts.

3. Understanding of Advanced Concepts:

- The student displayed some difficulty in understanding **the relationship between trigonometric functions** and their impact on geometric properties. For example, the **relation involving $\sin(6\theta) = \sin(4\theta) - \sin(2\theta)$** required more advanced insight into trigonometric equation solutions that were not fully grasped.

Recommendations for Improvement:

1. Review Advanced Trigonometric Identities:

- Focus on **multiple angle formulas** and how to simplify expressions involving **multiple angles** (e.g., $\sin(2\theta)$, $\sin(4\theta)$, $\sin(6\theta)$) to become more comfortable with solving these types of problems. Reviewing **compound angle identities** and practicing more examples will help reinforce this area.

2. Strengthen Analytical Geometry Understanding:

- Spend time practicing **triangle-based trigonometry**, particularly with the use of identities like $\cot(A/2)$, $\cos(A)$, and **sine rule**. These types of problems require solid geometric intuition, so focusing on visualizing the problem and applying triangle properties could be beneficial.

3. Practice Infinite Series and Summation:

- For problems involving **infinite series** or summation formulas, it is essential to master **the general formulas** for trigonometric sums and understand their derivations. Additional practice with problems involving infinite sums of trigonometric functions will be useful.

4. Work on Problem-Solving Techniques:

- For more complex equations, **breaking down the problem step by step** and simplifying terms carefully can lead to better solutions. Reviewing common algebraic tricks and solving **equations involving trigonometric terms** with multiple angles can help improve accuracy in future tests.

5. Clarify Basic Trigonometric Functions:

- Ensure full understanding and speed in answering basic **trigonometric function-related** questions, such as the properties of **sin, cos, tan, and cot** functions. This could include using trigonometric identities for simplification and solving for unknowns with a systematic approach.

By addressing these areas of improvement, the student can achieve a much stronger performance in future assessments and improve their overall mathematical proficiency.