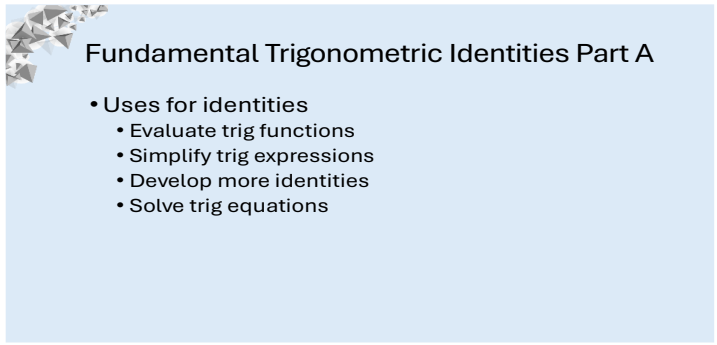
Math Weekly Lesson Preparation Guide

Teacher Name: Kimberly West	**Grade:** 11th /12th Precalculus
Week of: March 31st thru April 4th	**Lesson:** Fundamental Trigonometric Identities

Purpose: The Weekly Lesson Preparation Guide is to provide a structure that encourages teachers to think through and internalize the daily/weekly instructional expectations.

Planning Questions			
1. Which specific Tennessee **standard(s)** are being addressed in this lesson? What is the focus of this lesson? What will the lesson **objective** be for each day?	**P.G.TI.A.1** Apply trigonometric identities to verify identities and solve equations. Identities include: Pythagorean, reciprocal, quotient, sum/difference, double-angle, and half-angle **Vocabulary** *Identities *Cofunction Identities *Reciprocal **OBJECTIVE:** I can use fundamental identities to evaluate trigonometric expressions. I can use fundamental identities to simplify trigonometric expressions.		
Modeling: 2. What **specific tasks/problems** will you use to reveal understanding of the grade-level standard(s)? (refer to the Instructional Focus Document Evidence of Learning Statements			

Fundamental Trigonometric Identities

Reciprocal Identities

- $\sin u = \frac{1}{\csc u}$ $\quad \csc u = \frac{1}{\sin u}$
- $\cos u = \frac{1}{\sec u}$ $\quad \sec u = \frac{1}{\cos u}$
- $\tan u = \frac{1}{\cot u}$ $\quad \cot u = \frac{1}{\tan u}$

Pythagorean Identities

- $\sin^2 u + \cos^2 u = 1$
- $\tan^2 u + 1 = \sec^2 u$
- $1 + \cot^2 u = \csc^2 u$

Quotient Identities

- $\tan u = \frac{\sin u}{\cos u}$ $\quad \cot u = \frac{\cos u}{\sin u}$

Fundamental Trigonometric Identities

Even/Odd Identities

- $\cos(-u) = \cos u$
- $\sec(-u) = \sec u$
- $\sin(-u) = -\sin u$
- $\tan(-u) = -\tan u$
- $\csc(-u) = -\csc u$
- $\cot(-u) = -\cot u$

Cofunction Identities

- $\sin\left(\frac{\pi}{2} - u\right) = \cos u$
- $\cos\left(\frac{\pi}{2} - u\right) = \sin u$
- $\tan\left(\frac{\pi}{2} - u\right) = \cot u$
- $\cot\left(\frac{\pi}{2} - u\right) = \tan u$
- $\sec\left(\frac{\pi}{2} - u\right) = \csc u$
- $\csc\left(\frac{\pi}{2} - u\right) = \sec u$

Cofunction identities are set of trig. Identities that relate the values of trigonometric functions of complementary angles. Two angles are complementary if their sum is $\mathbf{90°}$, ***or*** $\frac{\pi}{2}$

The cofunction identities are based on the idea that for any angle θ:

- $\sin(90° - \theta) = \cos(\theta)$
- $\cos(90° - \theta) = \sin(\theta)$
- $\tan(90° - \theta) = \cot(\theta)$
- $\cot(90° - \theta) = \tan(\theta)$
- $\sec(90° - \theta) = \csc(\theta)$
- $\csc(90° - \theta) = \sec(\theta)$

Fundamental Trigonometric Identities

EXAMPLE:

- Simplify: $\frac{1+tan^2\theta}{\sec\theta}$

Fundamental Trigonometric Identities

EXAMPLE:

- Simplify $\frac{\sec^2 x-1}{\sin^2 x}$

Fundamental Trigonometric Identities

EXAMPLE:

- Simplify $\sin\varphi\,(\csc\varphi-\sin\varphi)$

Fundamental Trigonometric Identities

EXAMPLE:

- Simplify $\cos\left(\frac{\pi}{2}-x\right)(\sec x)$

3. Practice (student task)	*Selective Practice Problems: Board-work/ Handouts/Quizizz/Khan Academy *Look and listen for proper steps and vocabulary used to explain each step in the problem-solving process		
Additional Considerations			
If your lesson contains homework, how will you utilize the work? Will you need to send scaffolding notes home? Is there a strategy you can use to maximize homework?	**Homework will be utilized by:** **Align with Learning Objectives:** Ensure that homework directly relates to the concepts taught in class, allowing students to apply their learning. **Variety of Tasks:** Include different types of problems (e.g., practice, application, extension) to cater to various levels of understanding and to reinforce the concept from multiple angles. **Scaffolded Problems:** Start with easier problems and gradually increase difficulty. This helps build confidence and understanding before tackling more complex tasks. Extension Challenges: Include a few challenging problems that encourage critical thinking and exploration beyond the basic concepts.		