Unit 5: Similarity, Right Triangle Trigonometry, and Proof

Core Content

Cluster Title: Prove and Apply Trigonometric Identities
Standard (+) F.TF.9: Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.
Concepts and Skills to Master
- Prove the addition and subtraction formulas for sine, cosine, and tangent using trigonometric identities.   - Solve problems using addition and subtraction of trigonometric functions.

Supports for Teachers

Critical Background Knowledge
- Sine, cosine, and tangent   - Special right triangles
Academic Vocabulary
sine, cosine, tangent

Suggested Instructional Strategies	Resources
- The algebraic proofs for the sum and difference formulas for sine and tangent flow nicely once you know the cosine formulas. First use the distance formula and Pythagorean identity to derive the cosine formulas. Then allow students to try to derive the formulas for sine and tangent. A good starting point for the sine formulas is the cofunction identity; for the trig formulas, begin with the basic quotient identity. - Use a geometric proof for the derivation for the sine addition and subtraction formulas. From this, use algebraic derivations for the sum and difference formulas for cosine and tangent.	http://www.mathamazement.com/Lessons/Pre-Calculus/05_Analytic-Trigonometry/sum-and-difference-formulas.html http://www.cut-the-knot.org/proofs/sine_cosine.shtml

Sample Formative Assessment Tasks	
Skill-Based Task: Use a sum or difference formula to find the exact value for $\cos\left(\dfrac{5\pi}{12}\right)$.	**Problem Task:** Prove or disprove: $\tan\left(x+\dfrac{\pi}{4}\right)=1+\tan(x)$. Explain your answer verbally and algebraically.