

5.4 Sum and Difference Formulas

Objective

SWBAT

- Use sum and difference formulas to evaluate trigonometric functions, verify trigonometric identities, and solve trigonometric equations.

Vocabulary/Key Concepts

Compute Trigonometric Functions of Special Angles
Verify Identities

Sum and Difference Formulas

$$1. \sin(u + v) = \sin u \cos v + \cos u \sin v$$

$$2. \sin(u - v) = \sin u \cos v - \cos u \sin v$$

$$3. \cos(u + v) = \cos u \cos v - \sin u \sin v$$

$$4. \cos(u - v) = \cos u \cos v + \sin u \sin v$$

$$5. \tan(u + v) = \frac{\tan u + \tan v}{1 - \tan u \tan v} \quad 6. \tan(u - v) = \frac{\tan u - \tan v}{1 + \tan u \tan v}$$

Find the exact values of sine, cosine, and tangent of the angle.

1. $\frac{17\pi}{12}$

Find the exact values of sine, cosine, and tangent of the angle.

2. $-\frac{19\pi}{12}$

Write the equation as the sine, cosine, or tangent of an angle.

3. $\cos(0.96)\cos(0.42) + \sin(0.96)\sin(0.42)$

4. $\frac{\tan 154^\circ - \tan 49^\circ}{1 + \tan 154^\circ \cdot \tan 49^\circ}$

Find the exact value of the trig. function.

5. Find $\cos(v - u)$, given that $\sin u = \frac{5}{13}$, $\cos v = -\frac{3}{5}$, u & $v \in QII$.

Find the exact value of the trig. function.

6. Find $\sin(v - u)$, given that $\sin u = \frac{5}{13}$, $\cos v = -\frac{3}{5}$, u & $v \in QII$.

Find the exact value of the trig. function.

7. Find $\tan(v - u)$, given that $\sin u = \frac{5}{13}$, $\cos v = -\frac{3}{5}$, u & $v \in QII$.

Write the trigonometric expression as an algebraic expression.

8. $\cos(\arcsin x - \arctan 2x)$

Find the value of the expression w/o a calculator.

9. $\cos(\sin^{-1}(-1) + \cos^{-1}(0))$

10. $\cos\left(\cos^{-1}\left(-\frac{1}{2}\right) + \sin^{-1}(1)\right)$

Verify the identity.

11. $\cos(x + y) + \cos(x - y) = 2 \cos x \cos y$

Verify the identity.

12. $\sin(x + y)\sin(x - y) = \sin^2 x - \sin^2 y$