

**9.5 Sum and Difference Properties (3)**

Name: \_\_\_\_\_

**Show that the trig functions do NOT distribute over addition and subtraction by letting  $A = 60^\circ$  and  $B = 90^\circ$ :**

1.  $\sin(A+B) \neq \sin A + \sin B$

2.  $\cot(A-B) \neq \cot A - \cot B$

3.  $\sec(A+B) \neq \sec A + \sec B$

4.  $\csc(A-B) \neq \csc A - \csc B$

**Demonstrate that the given property is true by substituting  $A = \frac{2\pi}{3}$  and  $B = \frac{\pi}{6}$ :**

5.  $\cos(A-B) = \cos A \cdot \cos B + \sin A \cdot \sin B$

6.  $\sin(A-B) = \sin A \cdot \cos B - \cos A \cdot \sin B$

**Prove that the given equation is an identity:**

$$7. \cos(\theta - 90^\circ) = \sin \theta$$

$$8. \sec\left(x - \frac{\pi}{2}\right) = \csc x$$

$$9. \tan(x - 90^\circ) = -\cot x$$

$$10. \cos\left(x - \frac{3\pi}{2}\right) = -\sin x$$

$$11. \sin(x + \pi) = -\sin x$$

$$12. \frac{\cos(x - y)}{\sin x \cos y} = \cot x + \tan y$$

$$13. \sin\left(x + \frac{\pi}{6}\right) + \cos\left(x + \frac{\pi}{3}\right) = \cos x$$

$$14. \sin x \sin y = \frac{1}{2} [\cos(x - y) - \cos(x + y)]$$

$$15. (\cos A \cos B - \sin A \sin B)^2 + (\sin A \cos B + \cos A \sin B)^2 = 1$$

Hint: Don't foil!