

**10-1 Sum and Difference Formulas for Sine and Cosine**

Simplify the given expression.

1.  $\cos 105^\circ \cos 15^\circ + \sin 105^\circ \sin 15^\circ$

2.  $\sin \frac{4\pi}{3} \cos \frac{\pi}{3} - \cos \frac{4\pi}{3} \sin \frac{\pi}{3}$

Prove the given identity.

3.  $\cos(\pi + x) = -\cos x$

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

Find the exact value of each expression.

5.  $\cos 15^\circ$

6.  $\sin 105^\circ$

Verify these double angle formulas.

7.  $\sin(2\alpha) = 2 \sin \alpha \cos \alpha$

8.  $\cos(2\alpha) = \cos^2 \alpha - \sin^2 \alpha$