

9-3: Sum and Difference Identities Practice

Find the exact value of the expression.

1. $\sin 75^\circ$

2. $\sin 375^\circ$

3. $\cos 15^\circ$

4. $\sin\left(\frac{5\pi}{4} - \frac{\pi}{6}\right)$

5. $\sin\left(\frac{4\pi}{3} + \frac{\pi}{4}\right)$

6. $\cos\left(\frac{3\pi}{4} + \frac{\pi}{6}\right)$

Write each expression in terms of a single trigonometric function.

7. $\sin 7x \cos 2x - \cos 7x \sin 2x$

8. $\sin x \cos 3x + \cos x \sin 3x$

9. $\cos x \cos 2x + \sin x \sin 2x$

10. $\cos 4x \cos 2x - \sin 4x \sin 2x$

Find the exact value of the given functions.11. Given $\tan \alpha = -\frac{4}{3}$ in Quadrant II, and $\tan \beta = \frac{15}{8}$ in Quadrant III, find the following

a. $\sin(\alpha - \beta)$

b. $\cos(\alpha + \beta)$

12. Given $\tan \alpha = \frac{24}{7}$ in Quadrant I, and $\sin \beta = -\frac{8}{17}$ in Quadrant III, find the following

a. $\sin(\alpha + \beta)$

b. $\cos(\alpha + \beta)$

13. Given $\sin \alpha = \frac{3}{5}$ in Quadrant I, and $\cos \beta = -\frac{5}{13}$ in Quadrant II, find the following

a. $\sin(\alpha - \beta)$

b. $\cos(\alpha + \beta)$

Verify the identity.

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

15. $\cos(\theta + \pi) = -\cos \theta$

16. $\sin\left(\theta + \frac{\pi}{2}\right) = \cos \theta$

17. $\sin(\theta + \pi) = -\sin \theta$

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

19. $\sin\left(\frac{3\pi}{2} + \theta\right) = -\cos \theta$

20. $\cos 5x \cos 3x + \sin 5x \sin 3x = \cos^2 x - \sin^2 x$

21. $\cos(\alpha + \beta) + \cos(\alpha - \beta) = 2 \cos \alpha \cos \beta$

22. $\sin(\alpha + \beta) - \sin(\alpha - \beta) = 2 \cos \alpha \sin \beta$