Algebra 2 / Trig H Section 14.6—Sum and Difference Identities Problems--and Review

#1-7: Use a sum or difference identity to find exact values, in simplest form.

1. $\sin 105°$ 2. $\cos 75°$ 3. $\tan 15°$ 4. $\sin 345°$
5. $\cos 165°$ 6. $\tan 255°$ 7. $\cos 195°$

#8-13: Simplify to a trig function of a single angle and find the exact value, in simplest form.

8. $\dfrac{\tan 60° - \tan 15°}{1 + \tan 60° \tan 15°}$

9. $\cos 160° \cos 70° + \sin 160° \sin 70°$

10. $\sin\dfrac{2\pi}{3}\cos\dfrac{\pi}{12} + \cos\dfrac{2\pi}{3}\sin\dfrac{\pi}{12}$

11. $\cos 160° \cos 50° - \sin 160° \sin 50°$

12. $\dfrac{\tan\dfrac{2\pi}{3} + \tan\dfrac{7\pi}{6}}{1 - \tan\dfrac{2\pi}{3}\tan\dfrac{7\pi}{6}}$

13. $\sin 285° \cos 15° - \cos 285° \sin 15°$

#14-18: Given that $\sin A = \dfrac{4}{5}$, *where* $0 \le A \le \dfrac{\pi}{2}$ and $\tan B = \dfrac{-5}{12}$, *where* $\dfrac{-\pi}{2} < B \le 0$.
Find exact values in simplest form.

14. $\sin(A + B)$ 15. $\cos(A - B)$ 16. $\tan(A + B)$ 17. $\cot A$ 18. $\sec B$

#19-20: Simplify to a single trig function.

19. $\cos^2 y\left(1 + \cot^2 y\right)$

20. $\dfrac{\tan y + \cot y}{\csc^2 y}$

#21-22: Solve for x, *if* $0 \le x < 2\pi$.

21. $\cos\left(x + \dfrac{\pi}{3}\right) + \cos\left(x - \dfrac{\pi}{3}\right) = 1$

22. $\tan(x + \pi) + \cos\left(x - \dfrac{\pi}{2}\right) = 0$

#23-24: Prove each identity.

23. $\cos\left(x - \dfrac{3\pi}{2}\right) \equiv -\sin x$

24. $\sin\left(\dfrac{\pi}{6} + x\right) + \sin\left(\dfrac{\pi}{6} - x\right) \equiv \cos x$

Answers: 1. $\dfrac{\sqrt{6}+\sqrt{2}}{4}$ 2. $\dfrac{\sqrt{6}-\sqrt{2}}{4}$ 3. $2-\sqrt{3}$ 4. $\dfrac{-\sqrt{6}+\sqrt{2}}{4}$ 5. $\dfrac{-\sqrt{6}-\sqrt{2}}{4}$ 6. $2+\sqrt{3}$

7. $\dfrac{-\sqrt{6}-\sqrt{2}}{4}$ 8. $\tan 45°$; 1 9. $\cos 90°$; 0 10. $\sin\dfrac{3\pi}{4}$; $\dfrac{\sqrt{2}}{2}$ 11. $\cos 210°$; $\dfrac{-\sqrt{3}}{2}$

12. $\tan\dfrac{11\pi}{6}$; $\dfrac{-\sqrt{3}}{3}$ 13. $\sin 270°$; -1 14. $\dfrac{33}{65}$ 15. $\dfrac{16}{65}$ 16. $\dfrac{33}{56}$ 17. $\dfrac{3}{4}$ 18. $\dfrac{13}{12}$

19. $\cot^2 y$ 20. $\tan y$ 21. 0 22. $0, \pi$