

5.3/5.4 Double + Half Angle Quiz 2 Review

(You should still be able to use Basic + Sum/Diff Identities!!) Review Quiz 1!

CHAPTER 5 TEST

Prove each identity.

1. $\tan \theta = \sin \theta \sec \theta$

3. $(\sec x - 1)(\sec x + 1) = \tan^2 x$

5. $\frac{\cos t}{1 - \sin t} = \frac{1 + \sin t}{\cos t}$

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

9. $\cos^4 A - \sin^4 A = \cos 2A$

11. $\cot x - \tan x = \frac{\cos 2x}{\sin x \cos x}$

13. $\frac{\sec^2 \alpha}{\sin^2 \alpha} = \csc^2 \alpha + \sec^2 \alpha$

14. $(1 + \sec x)(1 - \cos x) = \tan^2 x \cos x$

15. $\frac{1}{\tan \theta + \cot \theta} = \csc \theta \sec \theta$

16. $\frac{\sin \theta + \cot \theta}{1 - \cos \theta} = \tan \theta$

17. $\cot^2 \theta - \cos^2 \theta = \cot^2 \theta \cos^2 \theta$

18. $\sec^2 x \csc^2 x = \sec^2 x + \csc^2 x$

Let $\sin A = -\frac{3}{5}$ with $270^\circ \leq A \leq 360^\circ$ and $\sin B = \frac{12}{13}$ with $90^\circ \leq B \leq 180^\circ$ and find

19. $\sin(A + B)$

21. $\cos 2B$

23. $\sin \frac{A}{2}$

20. $\cos(A - B)$

22. $\sin 2B$

24. $\cos \frac{A}{2}$

Find exact values for each of the following:

25. $\sin 75^\circ$

26. $\cos 15^\circ$

27. $\tan \frac{\pi}{12}$

28. $\cot \frac{\pi}{12}$

Write each expression as a single trigonometric function.

29. $\cos 4x \cos 5x - \sin 4x \sin 5x$

30. $\sin 15^\circ \cos 75^\circ + \cos 15^\circ \sin 75^\circ$

CHAPTER 5 TEST

For Problems 1-12, see the Solutions Manual.

NOTE For Problems 13-18, when the equation is an identity, the proof is given in the Solutions Manual.

13. Is an identity 14. Is an identity 15. Not an identity 16. Not an identity 17. Is an identity

18. Is an identity 19. $\frac{63}{65}$ 20. $-\frac{56}{65}$ 21. $\frac{119}{169}$ 22. $-\frac{120}{169}$ 23. $\frac{1}{\sqrt{10}}$ 24. $-\frac{3}{\sqrt{10}}$

NOTE For Problems 25-28, other answers are possible depending on the identity used.

25. $\frac{\sqrt{6} + \sqrt{2}}{4}$ 26. $\frac{\sqrt{6} + \sqrt{2}}{4}$ 27. $\frac{\sqrt{3} - 1}{\sqrt{3} + 1}$ 28. $\frac{\sqrt{3} + 1}{\sqrt{3} - 1}$ 29. $\cos 9x$ 30. $\sin 90^\circ = 1$

31. $\frac{3}{5}$ 32. $\frac{3}{5}$ 33. 1 34. $\frac{\sqrt{3}}{2}$ 35. $\frac{11}{5\sqrt{5}}$ 36. $\frac{11}{5\sqrt{5}}$ 37. $1 - 2x^2$

CHAPTER 6 TEST

1. $30^\circ, 150^\circ$ 2. $150^\circ, 330^\circ$ 3. $30^\circ, 90^\circ, 150^\circ, 270^\circ$ 4. $0^\circ, 60^\circ, 180^\circ, 300^\circ$ 5. $45^\circ, 135^\circ, 225^\circ, 315^\circ$

6. $90^\circ, 210^\circ, 330^\circ$ 7. 180° 8. $0^\circ, 240^\circ$ 9. $48.6^\circ, 131.4^\circ, 210^\circ, 330^\circ$

10. $95^\circ + 120^\circ k, 115^\circ + 120^\circ k$ where $k = 0, 1, 2$ 11. $0^\circ, 90^\circ$ 12. $90^\circ, 180^\circ$ 13. $40^\circ, 80^\circ, 160^\circ, 200^\circ, 280^\circ, 320^\circ$

14. $22.5^\circ, 112.5^\circ, 202.5^\circ, 292.5^\circ$ 15. $\frac{2k\pi}{3} + \frac{\pi}{3}$ 16. $\frac{\pi}{6} + 2k\pi$ 17. $\frac{\pi}{2} + \frac{2k\pi}{3}$

31. If $\sin A = -\frac{1}{\sqrt{5}}$ with $180^\circ \leq A \leq 270^\circ$, find $\cos 2A$ and $\cos \frac{A}{2}$.

32. If $\sec A = \sqrt{10}$ with $0^\circ \leq A \leq 90^\circ$, find $\sin 2A$ and $\sin \frac{A}{2}$.

33. Find $\tan A$ if $\tan B = \frac{1}{2}$ and $\tan(A + B) = 3$.

34. Find $\cos x$ if $\cos 2x = \frac{1}{2}$.

Evaluate each expression below without using a calculator. (Assume any variables represent positive numbers.)

35. $\cos\left(\arcsin \frac{4}{5} - \arctan 2\right)$

36. $\sin\left(\arccos \frac{4}{5} + \arctan 2\right)$

*use sum/diff formulas

CHAPTER 6 TEST

Find all solutions in the interval $0^\circ \leq \theta < 360^\circ$. If rounding is necessary, round to the nearest tenth of a degree.

1. $2 \sin \theta - 1 = 0$

2. $\sqrt{3} \tan \theta + 1 = 0$

3. $\cos \theta - 2 \sin \theta \cos \theta = 0$

4. $\tan \theta - 2 \cos \theta \tan \theta = 0$

5. $4 \cos \theta - 2 \sec \theta = 0$

6. $2 \sin \theta - \csc \theta = 1$

7. $\sin \frac{\theta}{2} + \cos \theta = 0$

8. $\cos \frac{\theta}{2} - \cos \theta = 0$

9. $4 \cos 2\theta + 2 \sin \theta = 1$

10. $\sin(3\theta - 45^\circ) = -\frac{\sqrt{3}}{2}$

11. $\sin \theta + \cos \theta = 1$

12. $\sin \theta - \cos \theta = 1$

13. $\cos 3\theta = -\frac{1}{2}$

14. $\tan 2\theta = 1$

Find all solutions for the following equations. Write your answers in radians using exact values.

15. $\cos 2x - 3 \cos x = -2$

16. $\sqrt{3} \sin x - \cos x = 0$

17. $\sin 2x \cos x + \cos 2x \sin x = -1$

18. $\sin^3 4x = 1$