# Pre-Calculus Test Prep

Chapter 6 Review

**Find the exact value for each expression below.**

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|---|---|---|---|
| 1. $\cos^{-1} 0$ | 2. $\sin^{-1}\left(-\frac{1}{2}\right)$ | 3. $\tan^{-1}(-\sqrt{3})$ | 4. $\cot^{-1}(-1)$ |

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| 5. $\tan\left[\cos^{-1}\left(-\frac{1}{2}\right)\right]$ | 6. $\csc\left(\sin^{-1}\frac{\sqrt{3}}{2}\right)$ | 7. $\cos\left(\sin^{-1}\frac{3}{5}\right)$ |
| 8. $\tan\left[\cos^{-1}\left(-\frac{12}{13}\right)\right]$ | 9. $\cos^{-1}\left[\tan\frac{3\pi}{4}\right]$ | 10. $\cos^{-1}\left(\cos\frac{4\pi}{3}\right)$ |
| 11. $\tan 105°$ | 12. $\cos\left(-\frac{\pi}{12}\right)$ | 13. $\tan\frac{\pi}{8}$ |

14. Prove the identity. $4\sin^2\theta + 2\cos^2\theta = 4 - 2\cos^2\theta$

**Prove the following identities.**

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| 15. $\dfrac{\cos(\alpha+\beta)}{\cos\alpha\sin\beta}=\cot\beta-\tan\alpha$ | 16. $\dfrac{(2\sin^2\theta-1)^2}{\sin^4\theta-\cos^4\theta}=1-2\cos^2\theta$ |
| 17. $1-\dfrac{\cos^2\theta}{1+\sin\theta}=\sin\theta$ | 18. $\dfrac{1-\cos\theta}{1+\cos\theta}=(\csc\theta-\cot\theta)^2$ |

**Given** $\tan\alpha = -\frac{4}{3}$ **when** $\frac{\pi}{2} < \alpha < \pi$ **and** $\cot\beta = \frac{12}{5}$ **when** $\pi < \beta < \frac{3\pi}{2}$**, find the exact values for…**

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|---|---|---|
| 19. $\cos(\alpha+\beta)$ | 20. $\sin(\alpha-\beta)$ | 21. $\tan(\alpha+\beta)$ |
| 22. $\cos(2\beta)$ | 23. $\sin\left(\frac{\beta}{2}\right)$ | 24. $\cos\left(\frac{\alpha}{2}\right)$ |

**Find the exact value of each expression.**

| | | |
|---|---|---|
| 25. $\sin\left(\cos^{-1}\frac{5}{13} - \cos^{-1}\frac{4}{5}\right)$ | 26. $\cos\left(\tan^{-1}(-1) + \cos^{-1}\left(-\frac{4}{5}\right)\right)$ | 27. $\cos\left(2\tan^{-1}\frac{12}{5}\right)$ |

**Solve each equation on the interval $[0, 2\pi)$.**

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| 28. $\tan\theta + \sqrt{3} = 0$ | 29. $\sin(3\theta) = 1$ |
| 30. $\sec^2 \theta = 4$ | 31. $\cos(2\theta) = \sin \theta$ |
| 32. $2 \cos^2 \theta + \cos \theta - 1 = 0$ | 33. $8 - 12 \sin^2 \theta = 4 \cos^2 \theta$ |

**Use a calculator to solve on the interval $[0, 2\pi)$. Round to the nearest hundredth.**

| | | |
|---|---|---|
| 34. $\cos \theta = 0.6$ | 35. $\cot \theta = 2$ | 36. $\csc \theta = -3$ |