

PreCalculus

Unit 5: Analytic Trig Review

Solve each equation.

Name _____

Date _____

1. $4 \cos^2 x - 3 = 0$

2. $2 \sin^2 x - \sin x - 3 = 0, \quad 0 \leq x < 2\pi$

3. $\sin(3\theta) = -1, \quad 0 \leq \theta < 2\pi$

4. $\sqrt{3} + \tan(2\theta) = 0$

5. $\sin\left(\frac{\theta}{2}\right) - 1 = 0$

6. $\sec\left(x - \frac{\pi}{5}\right) = 2, \quad 0 \leq x < 2\pi$

7. $4 \cos^2 x + 4 \cos x - 3 = 0, \quad 0 \leq x < 2\pi$

8. $2 \tan^2 x - \tan x - 6 = 0, \quad 0 \leq x < 2\pi$

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9. $\sin \theta = -0.2, \quad 0 \leq \theta < 2\pi$

10. $\tan x = 5, \quad 0 \leq x < 2\pi$

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Determine the exact value of each trigonometric function using a sum/difference and then again using a half/double angle to verify.

11. $\cos \frac{7\pi}{12}$

12. $\tan\left(-\frac{\pi}{12}\right)$

13. $\sin \frac{5\pi}{12}$

Prove each trigonometric identity.

14. $\tan \theta \cot \theta - \sin^2 \theta = \cos^2 \theta$

15. $4\cos^2 \theta + 3\sin^2 \theta = 3 + \cos^2 \theta$

16. $\frac{\csc \theta}{1 + \csc \theta} = \frac{1 - \sin \theta}{\cos^2 \theta}$

17. $\sec^4 \theta - \sec^2 \theta = \tan^4 \theta + \tan^2$

18. $\frac{\sin \theta + \cos \theta}{\sin \theta} - \frac{\cos \theta - \sin \theta}{\cos \theta} = \sec \theta \csc \theta$

19. $\sin(\alpha - \beta) \sin(\alpha + \beta) = \sin^2 \alpha - \sin^2 \beta$

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

21. $\frac{\cos(2\theta)}{1 + \sin(2\theta)} = \frac{\cot \theta - 1}{\cot \theta + 1}$

$$22. \frac{1+\sin\theta}{1-\sin\theta} - \frac{1-\sin\theta}{1+\sin\theta} = 4 \tan\theta \sec\theta$$

$$23. \frac{1-\sin x}{\cos x} = \frac{\cos x}{1+\sin x}$$

$$24. \frac{\sin(\alpha+\beta)}{\sin(\alpha-\beta)} = \frac{\tan\alpha + \tan\beta}{\tan\alpha - \tan\beta}$$

$$25. \frac{\cot\theta - \tan\theta}{\cot\theta + \tan\theta} = \cos(2\theta)$$

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$$26. \tan\frac{\theta}{2} = \csc\theta - \cot\theta$$

$$27. \sin\left(\frac{3\pi}{2} + \theta\right) = -\cos\theta$$