Summary of exercises

Mr. Neeman. 10B, November 10, 2011.

Trigonometric equations

#1. $\sin\alpha\cos\alpha - 2\cos\alpha = 0,\ \alpha \in [0, 2\pi]$

#2. $\sin^2\alpha = \frac{1}{4},\ \alpha \in [-\pi, \pi]$

#3. $\cos^2\alpha + 2 = -3\cos\alpha,\ \alpha \in [0, 4\pi]$

#4. $2\sin\alpha\tan\alpha + 2\sin\alpha + \tan\alpha + 1,\ \alpha \in [0, 2\pi]$

#5. $\sqrt{3}\cos\alpha = -\cos\alpha\tan\alpha,\ \alpha \in [-\pi, \pi]$

#6. $\sin^2\alpha + 5 = 4\sin\alpha,\ \alpha \in [0, 2\pi]$

#7. $4\cos^2\alpha = 3,\ \alpha \in [0, 2\pi]$

#8. $1 + \cos\alpha\sin\alpha = \cos\alpha + \sin\alpha,\ \alpha \in [-\pi, \pi]$

#9. $2\cos^2\alpha + 3\cos\alpha + 1 = 0,\ \alpha \in [0, 2\pi]$

#10. $3\cos^2\alpha - 1 = 0,\ \alpha \in [0, 2\pi]$

#11. $\sin^2\alpha - 5\sin\alpha = -4,\ \alpha \in [-\pi, \pi]$

#12. $2\cos\alpha\sin\alpha - 4\cos\alpha + \sin\alpha = 2,\ \alpha \in [0, 2\pi]$

#13. $\tan\alpha\sec\alpha - 2\sec\alpha = 0,\ \alpha \in [0, 4\pi]$

#14. $4\sin x\cos x = -4\cos x - \sin x - 1,\ \alpha \in [0, 2\pi]$

Trigonometric identities to prove

#1. $\dfrac{\tan^2 x}{\sec x} - \sec x = -\cos x$

#2. $\dfrac{1}{1+\sin x} + \dfrac{1}{1-\sin x} = 2\sec^2 x$

#3. $\dfrac{\sin x}{\cos x} + \dfrac{\cos x}{\sin x} = \sec x\csc x$

#4. $\csc x - \sin x = \cot x\cos x$

#5. $(\sec^2 x - 1)(\csc^2 - 1) = 1$

#6. $(\tan x + \cot x)\tan x = \sec^2 x$

#7. $(\cot x\sin x - \sin x)(\cos x + \sin x) = 2\cos^2 x - 1$

#8. $\sec x - \dfrac{\cot x}{\csc x} = \sin x\tan x$

#9. $\dfrac{\sin^2 x}{\cos x} + \cos x = \sec x$

#10. $\dfrac{\sec x}{1+\cot^2 x} = \sin x\tan x$