

TRIG REVIEW HOMEWORK No calculator except questions #14 & 20

I. EVALUATE THE FOLLOWING

1. $\sin \frac{\pi}{6}$ $\frac{1}{2}$	2. $\cos \frac{5\pi}{6}$ $-\frac{\sqrt{3}}{2}$	3. $\sin \frac{8\pi}{3}$ $\frac{\sqrt{3}}{2}$	4. $\tan \frac{3\pi}{4}$ -1
5. $\arccos\left(\frac{1}{2}\right)$ $\frac{\pi}{3}$	6. $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ $-\frac{\pi}{3}$	7. $\arctan(\sqrt{3})$ $\frac{\pi}{3}$	8. $\cos^{-1}(-1)$ π
9. $\tan^{-1}(1)$ $-\frac{\pi}{4}$	10. $\csc^{-1}(\sqrt{2})$ $\frac{\pi}{4}$	11. $\arcsin(-1)$ $-\frac{\pi}{2}$	12. $\arctan\left(\frac{\sqrt{3}}{3}\right)$ $\frac{\pi}{6}$

II. Solve on $[0, 2\pi)$

13. $2\sin^2 x + 3\sin x + 1 = 0$ $(2\sin x + 1)(\sin x + 1) = 0$ $\sin x = -\frac{1}{2}$ $\sin x = -1$ $\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{3\pi}{2}$	14. $4\sin^2 x = 2\cos x + 1$ $4(1 - \cos^2 x) - 2\cos x - 1 = 0$ $4\cos^2 + 2\cos x - 3 = 0$ Not factorable $x = .8614, 5.422$	15. $\frac{\cos x \cot x}{1 - \sin x} = 3$ $\frac{\cos x \cdot \frac{\cos x}{\sin x}}{1 - \sin x} = 3$ $\frac{\cos^2 x}{\sin x(1 - \sin x)} = 3$ $\frac{1 - \sin^2 x}{\sin x(1 - \sin x)} = 3$ $\frac{(1 + \sin x)(1 - \sin x)}{\sin x(1 - \sin x)} = 3$ $\frac{1 + \sin x}{\sin x} = 3$ $1 + \sin x = 3\sin x$ $1 - 2\sin x = 0$ $\sin x = \frac{1}{2}$ $x = \frac{\pi}{6}, \frac{5\pi}{6}$
16. $2\sin^2 x - \sin x - 1 = 0$ $(2\sin x + 1)(\sin x - 1) = 0$ $\sin x = -\frac{1}{2}$ $\sin x = 1$ $x = \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2}$	17. $1 + \sin x = 2\cos^2 x$ $1 + \sin x = 2(1 - \sin^2 x)$ $1 + \sin x - 2 + 2\sin^2 x = 0$ $2\sin^2 x + \sin x - 1 = 0$ $(2\sin x - 1)(\sin x + 1) = 0$ $\sin x = \frac{1}{2}$ $\sin x = -1$ $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$	18. $\sin^2 x - 1 = 0$ $\sin^2 x = 1$ $\sin x = \pm 1$ $x = \frac{\pi}{2}, \frac{3\pi}{2}$
19. $\csc x + \cot x = 1$ $\frac{1}{\sin x} + \frac{\cos x}{\sin x} = 1$ $(1 + \cos x) = (\sin x)^2$ $1 + 2\cos x + \cos^2 x = 1 - \cos^2 x$ $2\cos^2 x + 2\cos x = 0$ $\cos x(\cos x + 1) = 0$ $\frac{\pi}{2}, \frac{3\pi}{2}, \pi$ extra trios	20. $\sec^2 x + \frac{\sin x}{\cot x} = 1$ $\sec^2 x + \frac{1}{\tan x} = 1$ $\tan^2 x + \frac{1}{\tan x} = 0$ $\tan x(\tan^2 x + \frac{1}{\tan x}) = 0$ $\tan x = 0$ $\tan x = -\frac{1}{\tan^2 x}$ $0, \pi$ $x = \tan^{-1}(-\frac{1}{2})$ 0.4636	You Rock Trig Equations!

III. Simplify the following to simple trig functions:

21. $\cos x + \tan x \sin x$ $\frac{\cos x}{1} + \frac{\sin x}{\cos x} \cdot \sin x$ $\frac{\cos^2 x + \sin^2 x}{\cos x}$ $\frac{1}{\cos x} = \sec x$	22. $\sin^2 x + \sin x \cos^2 x$ $\sin x(\sin^2 x + \cos^2 x)$ $\sin x(1)$ $\sin x$	23. $\frac{\csc x \sin x}{\csc x}$ $\frac{1 - \sin x}{\csc x}$ $1 - \frac{\sin x}{\sin x}$ $1 - \sin^2 x$ $\cos^2 x$	24. $\frac{\sin x}{\cos x} + \frac{\cos x}{1 + \sin x}$ $\frac{\sin x(1 + \sin x) + \cos^2 x}{\cos x(1 + \sin x)}$ $\frac{\sin x + \sin^2 x + \cos^2 x}{\cos x(1 + \sin x)}$ $\frac{1 + \sin x}{\cos x(1 + \sin x)}$ $\frac{1}{\cos x} = \sec x$
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