Unit 5 Part 1 Test Review

① $5\cos\left(x+\frac{\pi}{2}\right)$

$5\left(\cos x\cos\frac{\pi}{2}-\sin x\sin\frac{\pi}{2}\right)$

$5(\cos x(0)-\sin x(1))$

$5(-\sin x)$

$-5\sin x$ (C)

② $2\sin\left(3x+\frac{\pi}{6}\right)$

$2\left(\sin 3x\cos\frac{\pi}{6}+\cos 3x\sin\frac{\pi}{6}\right)$

$2\left((\sin(3x))\left(\frac{\sqrt{3}}{2}\right)+(\cos(3x))\left(\frac{1}{2}\right)\right)$

$2\left(\frac{\sqrt{3}}{2}\sin(3x)+\frac{1}{2}\cos(3x)\right)$

$\sqrt{3}\sin(3x)+\cos(3x)$ (E)

③ $\tan\left(\frac{\pi}{4}+x\right)$

$\frac{\tan\frac{\pi}{4}+\tan x}{1-\tan\frac{\pi}{4}\tan x}$ $\quad \tan\frac{\pi}{4}=1$

$\frac{1+\tan x}{1-\tan x}$ (E)

④ $\cos(A-B)$ Acute $\angle$s = QI

$\sin A=\frac{3}{5}$ $\sin B=\frac{5}{13}$

$\cos A\cos B+\sin A\sin B$

$\frac{4}{5}\left(\frac{12}{13}\right)+\frac{3}{5}\left(\frac{5}{13}\right)$ (D)

$\frac{48}{65}+\frac{15}{65}=\frac{63}{65}$

⑤ $\sin 42^\circ\cos 48^\circ+\cos 42^\circ\sin 48^\circ$

$\sin(A+B)$ $\quad A=42^\circ\ B=48^\circ$

$\sin(42+48)$

$\sin 90^\circ=1$ (A)

⑥ $\sin(90-\theta)$

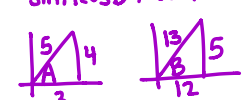
COFUNCTION

$\cos\theta$ (A)

⑦ $\sin A=\frac{4}{5}$ $\tan B=\frac{5}{12}$

$\sin(A+B)$

$\sin A\cos B+\cos A\sin B$



$\frac{4}{5}\left(\frac{12}{13}\right)+\frac{3}{5}\left(\frac{5}{13}\right)$ (A)

$\frac{48}{65}+\frac{15}{65}=\frac{63}{65}$

⑧ $\sin\theta=\cos\theta$ $\quad 45^\circ$ same sign

I & III (C)

⑨ $\sin 60^\circ=\cos(x+10)^\circ$

$\sin x=\cos(90-x)$

$\cos 30^\circ=\cos(x+10)$ (B)

$30=x+10$

$20=x$

⑩ $\cos 70\cos 40-\sin 70\sin 40$

$\cos(70+40)$

$\cos 110^\circ$ (C)

⑪ $\sin 96\cos 24+\cos 96\sin 24$

$\sin(96+24)$

$\sin 120^\circ$ $\quad$  $\quad$ ref $\angle=60^\circ$

$\sin 60^\circ$ (A)

⑫ $\sin(180+A)$

$\sin 180\cos A+\cos 180\sin A$

$0\cdot\cos A+(-1)\sin A$

$-\sin A$ (D)

⑬ $\sin 210\cos 30-\cos 210\sin 30$

$\sin(A-B)$

$\sin(210-30)$

$\sin 180^\circ=0$ (C)

⑭ $\sin 75^\circ=\sin(30^\circ+45^\circ)$

$\sin 30\cos 45+\cos 30\sin 45$

$\frac{1}{2}\left(\frac{1}{\sqrt{2}}\right)+\frac{\sqrt{3}}{2}\left(\frac{1}{\sqrt{2}}\right)=\frac{1}{2\sqrt{2}}+\frac{\sqrt{3}}{2\sqrt{2}}=\frac{1+\sqrt{3}}{2\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$

$=\frac{\sqrt{2}+\sqrt{6}}{4}$ (D)

⑮ $\cos(2x-1)=\sin(3x+6)$

$\cos\theta=\sin(90-\theta)$

$2x-1=90-(3x+6)$

$2x-1=90-3x-6$

$5x=85$

$x=17$ (B)

⑯ $\sin(x+20)=\cos x$ $\quad \cos x=\sin(90-x)$

$\sin(x+20)=\sin(90-x)$

$x+20=90-x$

$2x=70$

$x=35$ (A)

⑰ $\tan A=\frac{3}{5}$

$\tan B=\frac{1}{2}$

$\tan(A+B)=\frac{\tan A+\tan B}{1-\tan A\tan B}=\frac{\frac{3}{5}+\frac{1}{2}}{1-\frac{3}{5}\left(\frac{1}{2}\right)}$

$\frac{\frac{4}{6}+\frac{3}{6}}{1-\frac{2}{6}}$

$\frac{\frac{7}{6}}{\frac{4}{6}}=\frac{7}{6}\cdot\frac{6}{4}=\frac{7}{4}$ (D)

Review part 2 (Identities Quiz A)

*Remember: get stuff in terms of sin & cos! You get a formula sheet on test!

① $\sec x - \tan x$ (C)

$\frac{1}{\cos x} - \frac{\sin x}{\cos x}$

$\frac{1-\sin x}{\cos x}$

② $\frac{\sin^2 x + \cos^2 x}{\sin x}$

$\frac{1}{\sin x}$

$\csc x$ (A)

③ $\cos y(\csc y - \sec y)$

$\cos y \csc y - \cos y \sec y$

$\cos y \cdot \frac{1}{\sin y} - \cos y \cdot \frac{1}{\cos y}$

$\frac{\cos y}{\sin y} - 1$

$\cot y - 1$ (A)

④ $\cot\theta \sec\theta$

$\frac{\cos\theta}{\sin\theta} \cdot \frac{1}{\cos\theta}$

$\frac{1}{\sin\theta} = \csc\theta$ (D)

⑤ $\frac{\sec\theta}{\csc\theta}$ (quotient identity, too!)

$\frac{1}{\cos\theta} \cdot \frac{\sin\theta}{1}$

$\tan\theta$ (C)

⑥ $\frac{1-\sin^2 A}{2\cos A}$ $\cos^2 x + \sin^2 x = 1$

$\frac{\cos^2 A}{2\cos A}$

$\frac{\cos A}{2}$ (B)

⑦ $\sec x \cdot \csc x \cdot \cos x$

$\frac{1}{\cos x} \cdot \frac{1}{\sin x} \cdot \frac{\cos x}{1}$

$\frac{1}{\sin x} = \csc x$ (C)

⑧ $\sec^2\theta + \csc^2\theta$

$\frac{\sin^2\theta}{\sin^2\theta} \cdot \frac{1}{\cos^2\theta} + \frac{1}{\sin^2\theta} \cdot \frac{\cos^2\theta}{\cos^2\theta}$

$\frac{\sin^2\theta + \cos^2\theta}{\sin^2\theta\cos^2\theta}$

$\frac{1}{\sin^2\theta\cos^2\theta}$ (C)

⑨ $\frac{\sin^2 B}{\cos B} + \cos B \cdot \frac{\cos B}{\cos B}$

$\frac{\sin^2 B + \cos^2 B}{\cos B}$

$\frac{1}{\cos B}$ (B)

⑩ $\cos\theta(\sec\theta - \cos\theta)$

$\cos\theta\sec\theta - \cos^2\theta$

$1 - \cos^2\theta$

$\sin^2\theta$ (C)

⑪ $\csc\theta \cdot \tan\theta \cdot \cos\theta$

$\frac{1}{\sin\theta} \cdot \frac{\sin\theta}{\cos\theta} \cdot \cos\theta = 1$ (A)

⑫ $\sin\theta(\cot\theta - \csc\theta)$

$\sin\theta\left(\frac{\cos\theta}{\sin\theta}\right) - \sin\theta\csc\theta$

$\cos\theta - 1$ (D)

⑬ $\frac{\sin x \cos x}{\tan x}$

$\frac{\sin x \cos x}{\frac{\sin x}{\cos x}} = \sin x \cos x \cdot \frac{\cos x}{\sin x} = \cos^2 x$ (D)

⑭ Prove: $\frac{1}{1-\cos\theta} - \frac{1}{1+\cos\theta} = 2\csc\theta\cot\theta$

Left: common denom.!

$\frac{1+\cos\theta}{(1+\cos\theta)(1-\cos\theta)} - \frac{1-\cos\theta}{(1+\cos\theta)(1-\cos\theta)}$ ← diff. of squares

$\frac{1+\cos\theta - (1-\cos\theta)}{1-\cos^2\theta}$

$\frac{2\cos\theta}{\sin^2\theta}$

$\frac{2\cos\theta}{\sin\theta\sin\theta}$

$2\cot\theta\csc\theta$ ☺

*There will be at least one proof on test!