Trig II Review A

1. If $\sin A = \frac{m}{n}$ and $\tan A = \frac{m^2}{n^3}$, where $m, n \neq 0$, then what is $\cos A$ equivalent to?

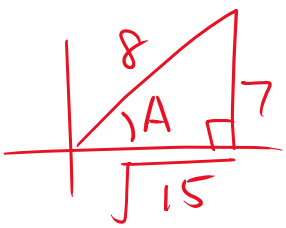
$\tan A = \frac{\sin A}{\cos A}$

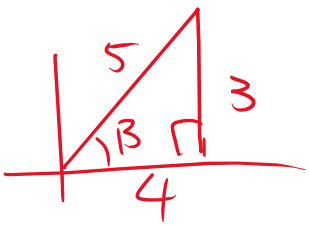
$\therefore \cos A = \frac{\sin A}{\tan A} = \frac{\frac{m}{n}}{\frac{m^2}{n^3}} = \frac{m}{n} \times \frac{n^3}{m^2} = \frac{n^2}{m}$

2. Prove

$\sqrt{\frac{1+\tan^2 x}{1-\sin^2 x}}$	$\sec^2 x$
$\sqrt{\frac{\sec^2 x}{\cos^2 x}}$	
$\frac{\sec x}{\cos x}$	
$\frac{\frac{1}{\cos x}}{\cos x} \rightarrow \frac{1}{\cos^2 x}$	
$\sec^2 x$	$=$

3. Given $\sin A = \frac{7}{8}$ and $\cos B = \frac{4}{5}$, where A and B are acute angles, determine the value of $\sin(A+B)$.





$\sin(A+B) = \sin A \cos B + \cos A \sin B$

$= \left(\frac{7}{8}\right)\left(\frac{4}{5}\right) + \left(\frac{\sqrt{15}}{8}\right)\left(\frac{3}{5}\right)$

$= \frac{28}{40} + \frac{3\sqrt{15}}{40} = \frac{28+3\sqrt{15}}{40}$

4. Simplify $\sin\left(\frac{3\theta}{5}\right)\cos\left(\frac{2\theta}{7}\right) - \cos\left(\frac{3\theta}{5}\right)\sin\left(\frac{2\theta}{7}\right)$

$= \sin\left(\frac{3\theta}{5} - \frac{2\theta}{7}\right)$

$= \sin\frac{11\theta}{35}$

5. Determine the exact value of $\sec\left(-\frac{\pi}{12}\right)$

$\sec\left(-\frac{\pi}{12}\right) = \frac{1}{\cos\left(-\frac{\pi}{12}\right)} = \frac{1}{\cos\left(\frac{\pi}{4} - \frac{\pi}{3}\right)} = \frac{2\sqrt{2}}{1+\sqrt{3}}$

$\cos\left(\frac{\pi}{4} - \frac{\pi}{3}\right) = \cos\frac{\pi}{4}\cdot\cos\frac{\pi}{3} + \sin\frac{\pi}{4}\cdot\sin\frac{\pi}{3}$

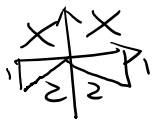
$= \left(\frac{1}{\sqrt{2}}\cdot\frac{1}{2}\right) + \left(\frac{1}{\sqrt{2}}\cdot\frac{\sqrt{3}}{2}\right)$

$= \frac{1}{2\sqrt{2}} + \frac{\sqrt{3}}{2\sqrt{2}} = \frac{1+\sqrt{3}}{2\sqrt{2}}$

6. Prove

$\frac{\sin x + \tan x}{\cos x + 1}$	$\tan x$
$\frac{\frac{\sin x\cos x}{\cos x} + \frac{\sin x}{\cos x}}{\cos x + 1}$	
$\frac{\sin x(\cos x + 1)}{\cos x}\cdot\frac{1}{\cos x + 1}$	
$\frac{\sin x}{\cos x}$	
$\tan x$	$=$

7. Write the general solution to the equation $\sin 4x = -\frac{1}{2}$ period $= \frac{2\pi}{4} = \frac{\pi}{2}$



let $A = 4x$

$\sin A = -\frac{1}{2}$

$A_R = \frac{\pi}{6}$

$A_1 = \frac{7\pi}{6}$, $A_2 = \frac{11\pi}{6}$

$x_1 = \frac{7\pi}{24}$, $x_2 = \frac{11\pi}{24}$

GS $\begin{cases} \frac{7\pi}{24} + \frac{\pi}{2}k \\ \frac{11\pi}{24} + \frac{\pi}{2}k \end{cases}$ $k \in \mathbb{Z}$