Exam 4 Review

Problem 1. Write an expression for $\sin x$ in terms of $\tan x$.

Problem 2. Write the following expression terms of $\sin\theta$ and $\cos\theta$, and simplify so that no quotients appear in the final answer.

$$\frac{\tan\theta\sin\theta - \cos\theta}{\tan\theta - 1}$$

Problem 3. Find the **exact** value of $\tan\left(-\frac{\pi}{12}\right)$.

Problem 4. Write an expression for $\sin 4x$ in terms of $\sin x$ and $\cos x$.

Problem 5. Veryify the identitiy

$$\frac{\sin\theta}{1-\cos\theta} = \frac{1+\cos\theta}{\sin\theta}$$

Problem 6. Sketch a graph for the given expression to conjecture an identity. Then verify your conjecture algebraically.

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

Problem 7. Verify the identity

$$-\frac{1}{2}\Big(\cos(x+y)-\cos(x-y)\Big) = \sin x \sin y$$

Problem 8. Recall that a half angle formula for tan is: $\tan\frac{\theta}{2} = \pm\sqrt{\frac{1-\cos\theta}{1+\cos\theta}}$. Use this formula to find the **exact** value for $\tan -22.5°$.