

Name : _____ ID. # : _____ SER. # : _____

1. Find the value of the following:

$$\sin 22.5^\circ \cos 22.5^\circ, \quad \cos^{-1}\left(\cos \frac{4\pi}{3}\right), \quad \sec [\tan^{-1}(-\frac{3}{4})], \quad \cos (2 \sec^{-1} \frac{13}{12}) \quad (4 \text{ pts})$$

2. If $y = -3 \sin \frac{x}{2} - 3 \cos \frac{x}{2}$ is written in the form $y = k \sin(mx + \alpha)$, where $0 \leq \alpha \leq 2\pi$, then find k and α and then the range and phase shift of the function. (3 pts)

3. Verify the identity: $\frac{\sin x - \sin 2x}{\cos x + \cos 2x} = -\tan \frac{x}{2}$ (3 pts)