Name: ______________________ GTID: ______________

Answer the questions in the spaces provided and put your answer in the BOX. Organize work clearly and simplify answers for full credit.

1a. Find the exact values: $\cos\left(\frac{\pi}{3}+\frac{\pi}{4}\right)$ and $\sec\left(\frac{\pi}{3}+\frac{\pi}{4}\right)$

$\cos\theta =$

$\sec\theta =$

1b. Given that $\tan u = \frac{3}{4}$, with u in quadrant III, and $\sin v = \frac{5}{13}$, with v in quadrant II, find the exact value of $\sin(u+v)$.

1c. Find the exact value: $2\sin\left(-\frac{\pi}{8}\right)\cos\left(-\frac{\pi}{8}\right)$

1d. Use the half angle identity to find: $\sin(22.5^\circ)$

1e. Simplify: $(1+\tan\theta)(1-\tan\theta)+\sec^2\theta$

1f. Find all solutions in the interval $[0, 2\pi]$ of: $\sin(2x) = -\frac{\sqrt{3}}{2}$

2. Use power-reducing formulas to rewrite the expression so that it does not contain trigonometric functions of power greater than 1.

$$\cos^4 x$$

3. Verify the identity.

$$\tan^2 x - \sin^2 x = \sin^4 x \sec^2 x$$

4. Solve the equation for all values in the range $[-2\pi, 2\pi]$.

$$(1 - \sin x)(1 + \sin x) = 0$$

5. Find the exact value: $\sin(165^\circ) \cdot \cos(45^\circ)$
   Hint: use the product-to-sum formula.

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