Instructions: Solve the following. Remember to show all work in order to receive full credit.

1. a) Factor and simplify $\sec^2 x \tan^2 x + \sec^2 x$.
   b) Perform the multiplication and simplify $(3 - 3 \sin x)(3 + 3 \sin x)$.

2. Verify the identities.
   a) $\tan x \cot x = 1$
   b) $\sin^3 x + \sin x \cos^2 x = \sin x$

3. Solve the following equations: $(0 \leq x \leq 360^0)$
   a) $\sin x + \sqrt{3} = -\sin x$
   b) $3 \tan^2 x - 3 = 0$
   c) $\sin^2 x - \sin x - 2 = 0$

4. Use sum and difference identities to write the following expressions as sine, cosine, or tangent of an angle.
   [Formulas on page 508]
   a) $\sin 140^0 \cos 50^0 + \cos 140^0 \sin 50^0$
   b) $\frac{\tan 140^0 - \tan 60^0}{1 + \tan 140^0 \tan 60^0}$

5. Find the exact value of $\cos \left(\frac{w}{2}\right)$, $\sin \left(\frac{w}{2}\right)$, $\tan \left(\frac{w}{2}\right)$ using the half angle formulas. [Formulas on page 518]
   $\sin w = \frac{12}{13}$, $\frac{\pi}{2} < w < \pi$

6. Find the exact values of $\sin 2w$, $\cos 2w$, $\tan 2w$ using the double angle formulas. [Formulas on page 515]
   $\cos w = -\frac{2}{3}$, $\frac{\pi}{2} < w < \pi$
   - REMEMBER after QUIZ # 8 there will be an exam in the TESTING CENTER
   - EXAM #4 will include concepts from Quizzes #7 and #8