The following is a general practice test for the trigonometry placement exam. This pre-test is not necessarily complete or comprehensive of all exam topics. Unlike this practice test, the placement exam is multiple-choice. Students are encouraged to work through these examples before consulting the solutions.

1. Solve the following equation for $\theta$, subject to the constraint $0 \leq \theta < 2\pi$. $\tan^2 \theta = \sqrt{3} \tan \theta$

2. Graph the following function over one period: $y = f(x) = 3 \sin \left(2x - \frac{\pi}{3}\right)$

3. Find the exact value of the following expression: $\sin \left(\cos^{-1} \frac{5}{13} - \cos^{-1} \frac{4}{5}\right)$

4. Calculate the exact value of $\phi = \tan^{-1} \left(-\frac{\sqrt{3}}{3}\right)$

5. Reduce the following expression to a single trigonometric function: $\frac{1 - \cos \theta}{\sin \theta} + \frac{\sin \theta}{1 - \cos \theta}$

6. Find all values of $\theta$ on the interval $0 \leq \theta < 2\pi$ that satisfy the following equation: $\cos 2\theta - 3 \sin \theta = 2$

7. Find the exact value of the following expression: $\cos \left(2 \tan^{-1} \frac{4}{3}\right)$

8. Find all solutions for $\phi$ on the interval $0 \leq \phi < 2\pi$, for the given equation: $\cos \phi = \sec \phi$

9. Refer to the figure on the following page to calculate the length of side $x$ to two decimal places

10. On a given (not necessarily right) triangle, the following is true: $a = 3$, $b = 4$, and $\gamma = 40^\circ$. Find the length of side $c$ accurate to two decimal places.