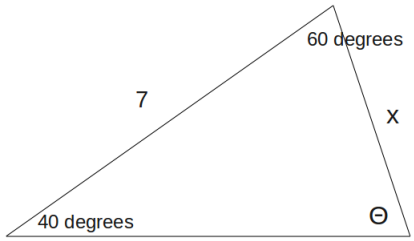
Trigonometry Pre-Test: North Dakota State University Mathematics Department

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 θ, 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 θ 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 ϕ 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 $\gamma = 40°$. Find the length of side c accurate to two decimal places.


60 degrees
7
x
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Θ