Worksheet # 4: Review of Trigonometry

1. Let O be the center of a circle whose circumference is 48 centimeters. Let P and Q be two points on the circle that are endpoints of an arc that is 6 centimeters long. Find the angle between the segments OQ and OP. Express your answer in radians.

   Find the distance between P and Q.

2. Show that $\sin(\cos^{-1}(x)) = \sqrt{1-x^2}$.

3. Simplify the expressions

   (a) $\tan(\sin^{-1}(x))$

   (b) $\sin(\tan^{-1}(x))$

   (c) $\sin(2\cos^{-1}(x))$

4. Find the exact values of the following expressions. Do not use a calculator.

   (a) $\tan^{-1}(1)$

   (b) $\tan(\tan^{-1}(10))$

   (c) $\sin^{-1}(\sin(7\pi/3))$

   (d) $\tan(\sin^{-1}(0.8))$

   (e) $\cos(\sin^{-1}(-0.6))$

5. Find all solutions to the following equations in the interval $[0, 2\pi]$. You will need to use some trigonometric identities.

   (a) $\sqrt{3}\cos(x) + 2\tan(x)\cos^2(x) = 0$

   (b) $3\cot^2(x) = 1$

   (c) $2\cos(x) + \sin(2x) = 0$

   (d) $\sin x = \tan x$

   (e) $2 + \cos(2x) = 3\cos x$

   (f) $2\sin^2(x) = 1$