MATH 104/GRACEY NAME_____
WORKSHEET/6.1-6.2

1. Complete the following statements:
   a. For a function to have an inverse it must be _____.

   b. The domain of $y = \arctan x$ equals the _____ of $y = \tan x$.

   c. The point $\left(-\frac{\pi}{6}, -\frac{1}{2}\right)$ lies on the graph of $y = \sin x$. Therefore the point _____ lies on the graph of $y = \arcsin x$.

   d. Find the domain and range of the following functions:

Function	Domain	Range
$y = \arcsin x$		
$y = \operatorname{arc}\csc x$		
$y = \arctan x$		
$y = \arccos x$		
$y = \operatorname{arc}\sec x$		
$y = \operatorname{arc}\cot x$		

2. Evaluate the following expressions.

a. $\operatorname{arc}\csc\left(\sqrt{2}\right) =$ _____

b. $\sin^{-1}(0) =$ _____

c. $\sec^{-1}\left(\frac{2\sqrt{3}}{3}\right) =$ _____

d. $\arctan\left(\tan\left(\frac{\pi}{6}\right)\right) =$ _____

e. $\cos^{-1}\left(-\frac{1}{2}\right) =$ _____

f. $\cot^{-1}\left(-\frac{\sqrt{3}}{3}\right) =$ _____

3. Give the exact value without using a calculator.

a. $\sin\left(\arccos\left(\frac{2}{5}\right)\right)$

b. $\tan\left(\sin^{-1}\left(\frac{1}{u}\right)\right)$

c. $\csc\left(\arctan\left(\frac{\sqrt{9-u^2}}{u}\right)\right)$

4. Solve the following equations. Identify what type of equation you are solving, e.g. linear, quadratic, etc.

a. $2x-7=12-5x$

b. $2x^2-5x=7$

c. $3x^2 = 4x + 19$

5. Find exact solutions over the given intervals.

a. $2\sin x\cos x - 2\sqrt{2}\cos x - \sqrt{3}\sin x + \sqrt{6} = 0,\ [0, 2\pi)$.

b. $\tan^2 x = 1,\ [0, 2\pi)$

c. $3\cot x + \sqrt{3} = 0,\ (-\infty, \infty)$

6. Find solutions over the given intervals. Round approximate solutions to the nearest tenth of a degree.

   a. $2\cos^2 x - 5\cos x - 5 = 0,\ [0^\circ, 360^\circ)$

b. $4\cos x + 9 = 0,\ \left[0^\circ, 360^\circ\right)$

c. $\sin x + 2\cos x = 1,\ \left[0^\circ, 360^\circ\right)$