Math 4050 Practice Problem Set #4
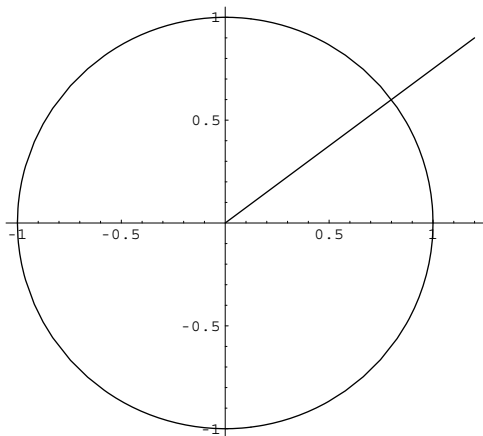
Problem 4.1 The unit circle and angle θ are shown. Fill in the blanks:

- $\cos \theta =$ _____

- $\sin \theta =$ _____

- $\tan (\theta + \pi/2) =$ _____

- $\sin(\theta - \pi) =$ _____

Problem 4.2 Let $a = \sin 10°$ and $b = \cos 10°$. Write the following expressions in terms of a, b, or both.

- $\tan 10° =$ _____

- $\sec 10° =$ _____

- $\sin 370° =$ _____

- $\sin 170° =$ _____

- $\cos(-10)° =$ _____

- $\sin 80° =$ _____

Problem 4.3 Find all angles θ so that $\sin \theta = -\dfrac{\sqrt{3}}{2}$.

Problem 4.4 Suppose that $\tan x < 0$ and $\sin x = \dfrac{2}{3}$. Find all six trigonometric functions of x.

Problem 4.5 Find all angles θ so that $\cos \theta = \dfrac{1}{2}$.

Problem 4.6 Find all angles θ so that $\tan \theta = -\sqrt{3}$.

Problem 4.7 Suppose that $\sin x < 0$ and $\cos x = \dfrac{3}{4}$. Find all six trigonometric functions of x.

Problem 4.8 Suppose that $\tan x = -4$ and $\sin x < 0$. Find all six trigonometric functions of x.

Problem 4.9 Simplify the given expressions. No partial credit will be given for incorrect answers.

- $\tan(-x) = $ _____

- $\csc(-\theta) = $ _____

- $\tan(x + \pi) = $ _____

- $\cos(-x) = $ _____

- $\dfrac{\cos x}{\sin x} = $ _____

- $\tan\left(\dfrac{\pi}{2} - x\right) = $ _____

- $\cos(\theta - \pi) = $ _____

- $\dfrac{1}{\tan x} = $ _____

- $\sin(-\theta) = $ _____

- $1 + \cot^2 x = $ _____

- $\dfrac{\sin x}{\cos x} = $ _____

- $\sec\left(\dfrac{\pi}{2} - x\right) = $ _____

- $\sin(\theta + 3\pi) = $ _____

- $\sin(\theta + 4\pi) = $ _____

- $\dfrac{1}{\sec x} = $ _____

- $\sec^2 x - 1 = $ _____

Problem 4.10 Evaluate the given expressions. No partial credit will be given for incorrect answers.

- $40°$ in radians $= $ _____

- $\cos 4\pi = $ _____

- $\sin \dfrac{19\pi}{4} = $ _____

- $\tan \dfrac{11\pi}{6} = $ _____

- $\cos \dfrac{2\pi}{3} = $ _____

- $\sin\left(-\dfrac{3\pi}{2}\right) = $ _____

- $\sin 3\pi = $ _____

- $\cos \dfrac{5\pi}{6} = $ _____

- $\tan \dfrac{5\pi}{4} = $ _____

- $\sin \dfrac{\pi}{6} = $ _____

- $\cos \dfrac{\pi}{2} = $ _____

- $\tan \dfrac{4\pi}{3} = $ _____

- $\cos 2007\pi = $ _____

Problem 4.11 Solve for c in $\triangle ABC$ if $\alpha = m\angle A = 40°$, $\beta = m\angle B = 60°$, and $a = 40$. Express your answer accurate to one decimal place.

Problem 4.12 Find $\angle B$ in $\triangle ABC$ if $a = 8$, $b = 14$ and $\gamma = m\angle C = 70°$. Express your answer in degrees, accurate to one decimal place.