

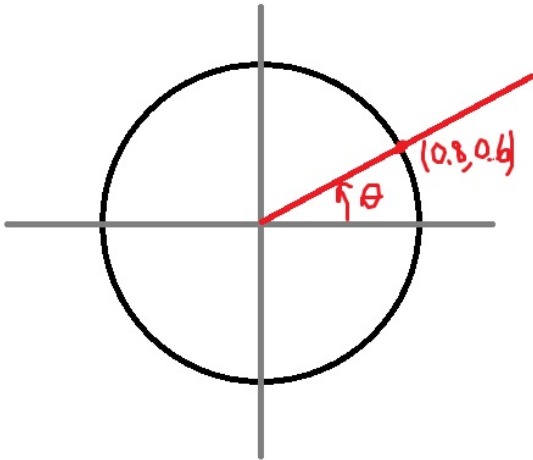
Math 4050

Practice Problem Set #4

At the top of your write-up, you must also write a statement attesting that you have at least thought about all assigned problems. Points will be deducted if you do not write this statement. This does not mean that you solved all of the problems — just that you gave some thought about how to solve every problem. For the sake of preparing for the state certification exam, as well as for your own integrity, I'd prefer that you are honest when writing this statement.

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 $a = \sin 10^\circ$ and $b = \cos 10^\circ$. Write the following expressions in terms of a , b , or both.

- $\tan 10^\circ =$ _____
- $\sec 10^\circ =$ _____
- $\sin 370^\circ =$ _____
- $\sin 170^\circ =$ _____
- $\cos(-10)^\circ =$ _____
- $\sin 80^\circ =$ _____

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

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

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

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

Problem 4.7 Suppose that $\sin x < 0$ and $\cos x = \frac{3}{4}$. 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.

- $\tan(-x) =$ _____
- $\csc(-\theta) =$ _____
- $\tan(x + \pi) =$ _____
- $\cos(-x) =$ _____
- $\frac{\cos x}{\sin x} =$ _____
- $\tan\left(\frac{\pi}{2} - x\right) =$ _____
- $\cos(\theta - \pi) =$ _____
- $\frac{1}{\tan x} =$ _____
- $\sin(-\theta) =$ _____
- $1 + \cot^2 x =$ _____
- $\frac{\sin x}{\cos x} =$ _____
- $\sec\left(\frac{\pi}{2} - x\right) =$ _____
- $\sin(\theta + 3\pi) =$ _____
- $\sin(\theta + 4\pi) =$ _____
- $\frac{1}{\sec x} =$ _____
- $\sec^2 x - 1 =$ _____

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

- 40° in radians = _____
- $\cos 4\pi =$ _____
- $\sin \frac{19\pi}{4} =$ _____

- $\tan \frac{11\pi}{6} = \underline{\hspace{2cm}}$
- $\cos \frac{2\pi}{3} = \underline{\hspace{2cm}}$
- $\sin \left(-\frac{3\pi}{2}\right) = \underline{\hspace{2cm}}$
- $\sin 3\pi = \underline{\hspace{2cm}}$
- $\cos \frac{5\pi}{6} = \underline{\hspace{2cm}}$
- $\tan \frac{5\pi}{4} = \underline{\hspace{2cm}}$
- $\sin \frac{\pi}{6} = \underline{\hspace{2cm}}$
- $\cos \frac{\pi}{2} = \underline{\hspace{2cm}}$
- $\tan \frac{4\pi}{3} = \underline{\hspace{2cm}}$
- $\cos 2007\pi = \underline{\hspace{2cm}}$

Problem 4.11 Solve for c in $\triangle ABC$ if $\alpha = m\angle A = 40^\circ$, $\beta = m\angle B = 60^\circ$, 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 $\gamma = m\angle C = 70^\circ$. Express your answer in degrees, accurate to one decimal place.