

College Algebra

Unit 6 LT 1 Practice Day 1

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Date \_\_\_\_\_ Period \_\_\_\_\_

Solve each equation for exact solutions over the interval of  $[0^\circ, 360^\circ)$ . If necessary, round answers to the nearest ~~tenths~~ hundredths.

1.)  $6\tan^2x + 7\tanx = 3$

$6\tan^2x + 7\tanx - 3 = 0$

$(2\tanx + 3)(3\tanx - 1) = 0$

$\tanx = -3/2 \quad \tanx = 1/3$

RA:  $56.31^\circ \quad \text{RA: } 18.43^\circ$

$x = 123.69^\circ, 303.69^\circ, 18.43^\circ, 198.43^\circ$

2.)  $5\sin^2x + 4\sinx - 1 = 0$

$(\sinx + 1)(5\sinx - 1) = 0$

$\sinx = -1 \quad \sinx = 1/5$   
 $x = 270^\circ \quad \text{RA: } 11.54^\circ$

$x = 270^\circ, 11.54^\circ, 168.46^\circ$

3.)  $(4\cos^2 - 3)(\tanx + 1) = 0$

$\sqrt{\cos^2x} = \sqrt{3/4} \quad \tanx = -1$

RA:  $45^\circ$

$\cosx = \pm \sqrt{3}/2$   
 RA:  $30^\circ$

$x = 30^\circ, 150^\circ, 210^\circ, 330^\circ, 135^\circ, 315^\circ$

4.)  $\secx \cscx = -\sqrt{2} \cscx$

$\secx \cscx + \sqrt{2} \cscx = 0$

$\cscx (\secx + \sqrt{2}) = 0$

$\cscx = 0 \quad \secx = -\sqrt{2}$

DNE  $\cosx = -\frac{1}{\sqrt{2}}$

RA:  $45^\circ$

$x = 135^\circ, 225^\circ$

5.)  $\tan^2x + \tanx - 2 = 0$

$(\tanx + 2)(\tanx - 1) = 0$

$\tanx = -2 \quad \tanx = 1$

RA:  $63.43^\circ \quad \text{RA: } 45^\circ$

$x = 116.57^\circ, 296.57^\circ, 45^\circ, 225^\circ$

6.)  $5\sin^2x + 3\sinx = 0$

$\sinx (5\sinx + 3) = 0$

$\sinx = 0 \quad \sinx = -3/5$   
 RA:  $36.87^\circ$

$x = 0^\circ, 180^\circ, 216.87^\circ, 323.13^\circ$

Solve each equation for exact solutions over the interval  $[0, 2\pi)$ . If necessary, round answers to the nearest tenths.

7.)  $3\sin^2x - 5\sin x + 2 = 0$

$\begin{matrix} 3 \\ -5 \end{matrix} \times \begin{matrix} 6 \\ -2 \end{matrix}$   
 $(3\sin x - 2)(\sin x - 1) = 0$   
 $\sin x = 2/3 \quad \sin x = 1$

$x = .73, 2.41, \pi/2$

8.)  $2\cos^2x + \cos x - 1 = 0$

$\begin{matrix} -2 \\ 1 \end{matrix} \times \begin{matrix} -1 \\ 1 \end{matrix}$   
 $(2\cos x - 1)(\cos x + 1) = 0$   
 $\cos x = 1/2 \quad \cos x = -1$

$x = \pi/3, 5\pi/3, \pi$

9.)  $\sqrt{3}\cos x = \cos x \cot x$

$\sqrt{3}\cos x - \cos x \cot x = 0$   
 $\cos x (\sqrt{3} - \cot x) = 0$   
 $\cos x = 0 \quad \cot x = \sqrt{3}$   
 $\tan x = \frac{1}{\sqrt{3}} \rightarrow \frac{\sqrt{3}}{3}$

$x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{6}, \frac{7\pi}{6}$

10.)  $\sec x \csc x = -2\csc x$

$\sec x \csc x + 2 \csc x = 0$   
 $\csc x (\sec x + 2) = 0$   
 $\csc x = 0 \quad \sec x = -2$   
 DNE  $\cos x = -\frac{1}{2}$   
 RA:  $\pi/3$

$x = \frac{2\pi}{3}, \frac{4\pi}{3}$

11.)  $2\tan^2x - \tan x = 1$

$\begin{matrix} -2 \\ -1 \end{matrix} \times \begin{matrix} 1 \\ 1 \end{matrix}$   
 $2\tan^2x - \tan x - 1 = 0$   
 $(\tan x - 1)(2\tan x + 1) = 0$   
 $\tan x = 1 \quad \tan x = -1/2$   
 RA:  $\pi/4 \quad \text{RA: } .46$

$x = \frac{\pi}{4}, \frac{5\pi}{4}, 2.68, 5.82$

12.)  $\sqrt{3}\csc^2x + 2\csc x = 0$

$\csc x (\sqrt{3}\csc x + 2) = 0$   
 $\csc x = 0 \quad \csc x = -\frac{2}{\sqrt{3}}$   
 DNE  $\sin x = -\frac{\sqrt{3}}{2}$   
 RA:  $\pi/3$

$x = 4\pi/3, 5\pi/3$