# Today's Plan:

***Learning Target (standard)***: I will simplify inverse trigonometric expressions and solve trigonometric equations.

***Students will***: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

***Teacher will***: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

***Assessment***: Board work, homework check and homework assignment

***Differentiation***: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

# Inverse Trig Functions & Equations

1) $\pi$

2) $-\frac{\pi}{6}$

3) $\frac{\pi}{2}$

4) $\pi$

5) $\sqrt{3}$

6) $\frac{12}{5}$

7) $\theta = \frac{\pi}{6}, \frac{11\pi}{6}$

8) $\theta = \frac{3\pi}{4}, \frac{5\pi}{4}$

9) $\theta = \frac{3\pi}{4}, \frac{7\pi}{4}$

10) $\theta = \frac{\pi}{12}, \frac{11\pi}{12}, \frac{13\pi}{12}, \frac{23\pi}{12}$

11) no solution

12) $\theta = \frac{\pi}{16}, \frac{3\pi}{16}, \frac{9\pi}{16}, \frac{11\pi}{16}, \frac{17\pi}{16}, \frac{19\pi}{16}, \frac{25\pi}{16}, \frac{27\pi}{16}$

13) $\theta = \frac{3\pi}{2} + 2\pi k$

14) $\theta = \frac{\pi}{4} + 2\pi k, \theta = \frac{7\pi}{4} + 2\pi k$

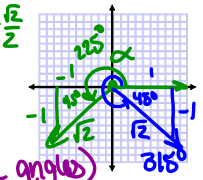
15) $\theta = -\frac{\pi}{12} + 2\pi k, \theta = \frac{5\pi}{12} + 2\pi k$

16) $\theta = -\frac{\pi}{6} + 2\pi k, \theta = \frac{3\pi}{2} + 2\pi k$

12) $\frac{1}{2}\cdot\sin(-4\theta)=-\frac{\sqrt{2}}{4}$

$\sin(-4\theta)=-\frac{\sqrt{2}}{2}$

$\sin\alpha=-\frac{\sqrt{2}}{2}$




reflected over y-axis (clockwise angles)

$225°=-\frac{3\pi}{4}$

$315°=-\frac{\pi}{4}$

$-4\theta=-\frac{3\pi}{4}-2\pi k$

$\theta=\frac{3\pi}{16}+\frac{\pi}{2}k$

$k=0\quad \theta=\frac{3\pi}{16}$

$k=1\quad \theta=\frac{3\pi}{16}+\frac{\pi}{2}\quad \theta=\frac{11\pi}{16}$

$k=2\quad \theta=\frac{3\pi}{16}+\pi\quad \theta=\frac{19\pi}{16}$

$k=3\quad \theta=\frac{3\pi}{16}+\frac{3\pi}{2}\quad \theta=\frac{27\pi}{16}$

$-4\theta=-\frac{\pi}{4}-2\pi k$

$\theta=\frac{\pi}{16}+\frac{\pi}{2}k$

$k=0\quad \theta=\frac{\pi}{16}$

$k=1\quad \theta=\frac{\pi}{16}+\frac{\pi}{2}\quad \theta=\frac{9\pi}{16}$

$k=2\quad \theta=\frac{\pi}{16}+\pi\quad \theta=\frac{17\pi}{16}$

$k=3\quad \theta=\frac{\pi}{16}+\frac{3\pi}{2}\quad \theta=\frac{25\pi}{16}$

$\theta=\frac{\pi}{16},\frac{3\pi}{16},\frac{9\pi}{16},\frac{11\pi}{16},\frac{17\pi}{16},\frac{19\pi}{16},\frac{25\pi}{16},\frac{27\pi}{16}$

Solve the equation for $0\le\theta\le2\pi$.

$(\tan\theta-1)(\sec\theta-1)=0$

$\tan\theta-1=0$

$\tan\theta=1$

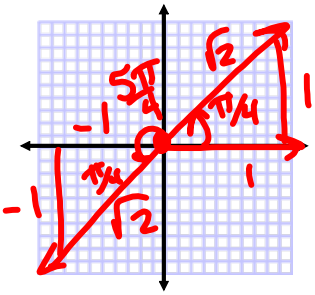
$\theta=\frac{\pi}{4},\frac{5\pi}{4}$

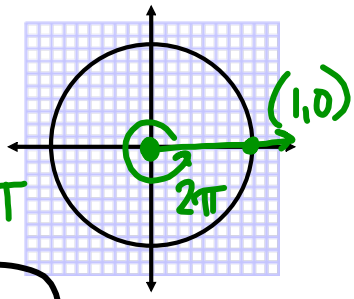
$\sec\theta-1=0$

$\sec\theta=1=\frac{r}{x}$

$r=1$

$x=1$




$\theta=0,2\pi$

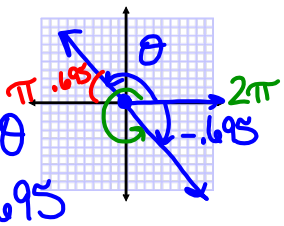
$\theta=0,\frac{\pi}{4},\frac{5\pi}{4},2\pi$

Solve the equation for $0 \le \theta \le 2\pi$.

$$\cot\left(\frac{\theta}{2}\right) = -1.2$$

$\tan^{-1}\left(\frac{1}{-1.2}\right) = \theta$

$\theta = -0.695$




$\theta = \pi - .695$

$\theta = 2.447$

$\frac{\theta}{2} = 2.447 + \pi k$

$\theta = 4.894 + 2\pi k$

$k = 0$

$\theta = 4.894$

$\theta = 2\pi - .695$

$\theta = 5.588$

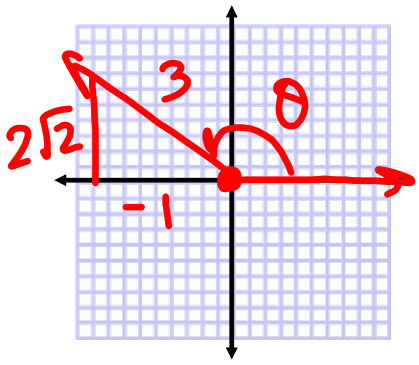
$\frac{\theta}{2} = 5.588 + \pi k$

$\theta = 11.176 + 2\pi k$

bigger than $2\pi$

Find the exact value of the expression.

$$\tan\left[\cos^{-1}\left(-\frac{1}{3}\right)\right]$$

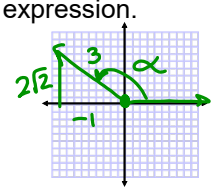


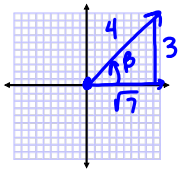

$= \tan\theta$

$= -2\sqrt{2}$

Find the exact value of the expression.

$$\csc\left[\cos^{-1}\left(-\frac{1}{3}\right)-\sin^{-1}\left(\frac{3}{4}\right)\right]$$




$= \csc(\alpha-\beta)$

$= \dfrac{1}{\sin(\alpha-\beta)}$

$= \dfrac{1}{\sin\alpha\cos\beta-\cos\alpha\sin\beta}$

$= \dfrac{1}{\left(\frac{2\sqrt{2}}{3}\right)\left(\frac{\sqrt{7}}{4}\right)-\left(-\frac{1}{3}\right)\left(\frac{3}{4}\right)}$

$= \dfrac{1}{\frac{2\sqrt{14}}{12}+\frac{3}{12}}$

$= \dfrac{1}{\frac{2\sqrt{14}+3}{12}}$

$= \dfrac{12}{2\sqrt{14}+3}\cdot\dfrac{2\sqrt{14}-3}{2\sqrt{14}-3}$

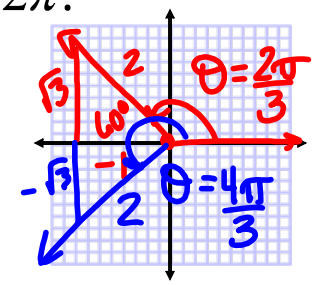
$= \dfrac{24\sqrt{14}-36}{56-9}$

$= \dfrac{24\sqrt{14}-36}{47}$

Solve the equation for $0 \le \theta \le 2\pi$.

$$2\cos^2\theta-\cos\theta-1=0$$

$(2\cos\theta+1)(\cos\theta-1)=0$




$2\cos\theta+1=0$

$2\cos\theta=-1$

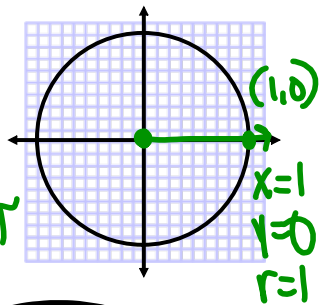
$\cos\theta=-\frac{1}{2}$

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

$\cos\theta-1=0$

$\cos\theta=1$

$\theta=0,2\pi$




$\theta=0,\frac{2\pi}{3},\frac{4\pi}{3},2\pi$

# Assignment:

p.500 #3,11,19,25,33,37,41

p.510 #9,13,21,33,35

* Check answers in the back of the book *

* QUIZ Monday *