Pre-Calc Academic

Name_____

STUDY GUIDE (SECTION 4.7) Key

Date_____ Period____

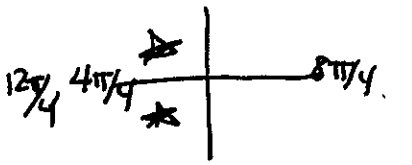
Solve each equation for $0 \le \theta < 4\pi$. Put answer in degrees and radians

1) $\sec\theta = -\sqrt{2}$ $\quad -\frac{1}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$

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

$\theta = 135^\circ, 225^\circ, 495^\circ, 585^\circ$

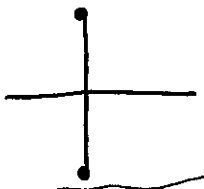
$\theta = 3\pi/4, 5\pi/4, 11\pi/4, 13\pi/4$



2) $\frac{0}{1} = \cot\theta$ $\quad \tan\theta = 1/0$ $\quad \tan\theta = \text{und}$

$\theta = 90^\circ, 270^\circ, 450^\circ, 630^\circ$

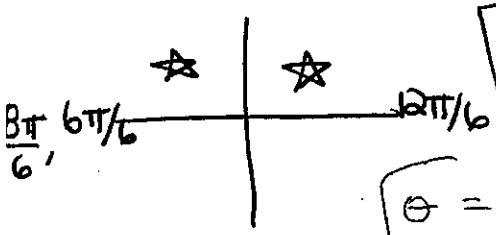
$\theta = \pi/2, 3\pi/2, 5\pi/2, 7\pi/2$



3) $\frac{1}{2} = \sin\theta$

$\theta = \pi/6, 5\pi/6, 13\pi/6, 17\pi/6$

$\theta = 30^\circ, 150^\circ, 390^\circ, 510^\circ$



4) $\cot\theta = -\frac{\sqrt{3}}{3}$ $\rightarrow$ $\frac{-3}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}} = \frac{-3\sqrt{3}}{3} = -\sqrt{3}$

$\tan\theta = -\sqrt{3}$

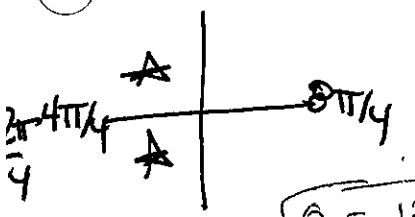
$\theta = 2\pi/3, 5\pi/3, 8\pi/3, 11\pi/3$

$\theta = 120^\circ, 300^\circ, 480^\circ, 660^\circ$

5) $\cos\theta = -\frac{\sqrt{2}}{2}$

$\theta = 3\pi/4, 5\pi/4, 11\pi/4, 13\pi/4$

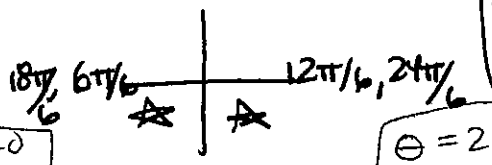
$\theta = 135^\circ, 225^\circ, 495^\circ, 585^\circ$



6) $\csc\theta = \frac{-2}{1}$ $\quad \sin\theta = -1/2$

$\theta = 7\pi/6, 11\pi/6, 19\pi/6, 23\pi/6$

$\theta = 210^\circ, 330^\circ, 570^\circ, 690^\circ$

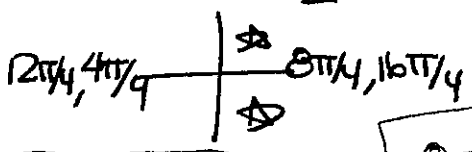


7) $\sec\theta = \sqrt{2}$ $\rightarrow$ $\frac{1}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\cos\theta = \frac{\sqrt{2}}{2}$

$\theta = \pi/4, 7\pi/4, 9\pi/4, 15\pi/4$

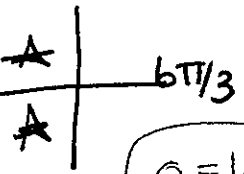
$\theta = 45^\circ, 315^\circ, 405^\circ, 675^\circ$



8) $-2 = \sec\theta$ $\quad \cos\theta = -1/2$

$\theta = 2\pi/3, 4\pi/3, 8\pi/3, 10\pi/3$

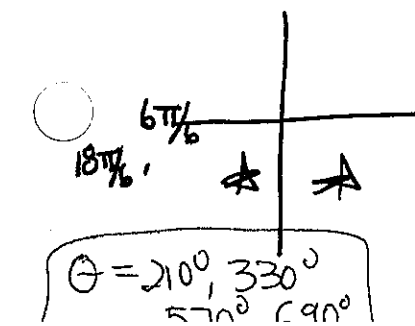
$\theta = 120^\circ, 240^\circ, 480^\circ, 600^\circ$



9) $-\frac{1}{2} = \sin\theta$

$\theta = 7\pi/6, 11\pi/6, 19\pi/6, 23\pi/6$

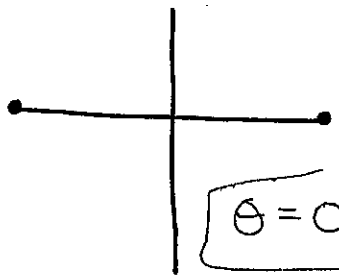
$\theta = 210^\circ, 330^\circ, 570^\circ, 690^\circ$



10) $0 = \sin\theta$

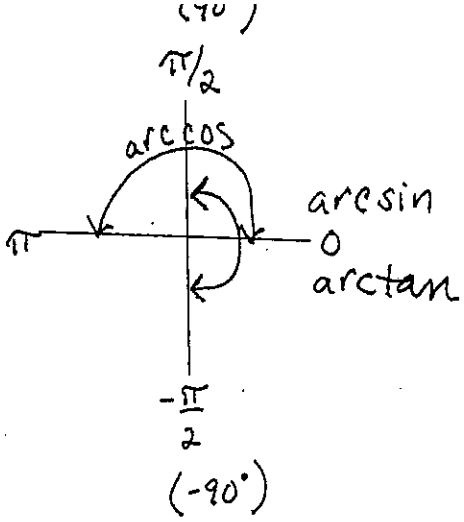
$\theta = 0, \pi, 2\pi, 3\pi$

$\theta = 0^\circ, 180^\circ, 360^\circ, 540^\circ$



Evaluate the following without a calculator:

Key



arcsin(√3/2) = $\pi/3$

sin(√3/2)

arcsin(−1) = $-\pi/2$

$-\pi/2$ (0, -1)

arccos(0) = $\pi/2$

$\pi/2$ (0, 1)

arccos(√2/2) = $\pi/4$

+ cos(√2/2)

arctan(0) = 0

$\pi/2$ (0,1) 1/0 $-\pi/2$

arctan(−1) = $-\pi/4$

−

arcsin(√3) = undefined

↑ greater than 1

arctan(1) = $\pi/4$

arccos(−√2/2) = $3\pi/4$

$\frac{4\pi}{4}$ π

arctan(−√3/3) = $-\pi/6$

−

arccos(−1/2) = $2\pi/3$

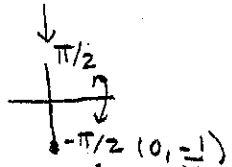
$\frac{3\pi}{3}$ π

arctan(√3) = $\pi/3$

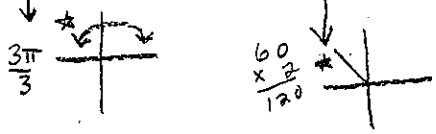
+

Evaluate each without a calculator:

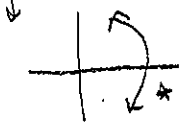
$\cos(\arcsin(-1)) =$ $\cos(-\pi/2) = \boxed{0}$



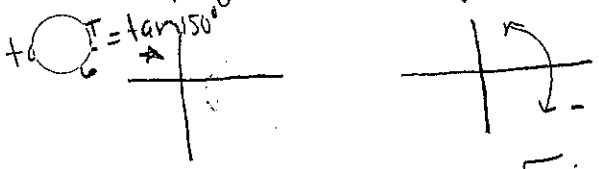
$\tan(\arccos(-\frac{1}{2})) =$ $\tan(2\pi/3) = \boxed{-\sqrt{3}}$



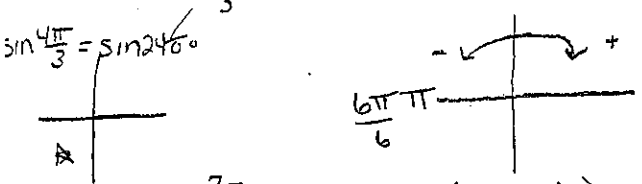
$\sin(\arctan(-\frac{\sqrt{3}}{3})) =$ $\sin(-\pi/6) = \boxed{-1/2}$



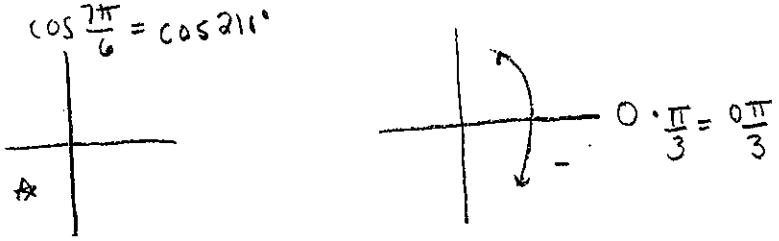
$\arctan(\tan\frac{5\pi}{6}) =$ $\arctan(-\sqrt{3}/3) = \boxed{-\pi/6}$



$\arccos(\sin\frac{4\pi}{3}) =$ $\arccos(-\sqrt{3}/2) = \boxed{5\pi/6}$



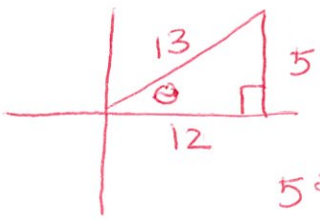
$\arcsin(\cos\frac{7\pi}{6}) =$ $\arcsin(-\sqrt{3}/2) = \boxed{-\pi/3}$



Evaluate each of the following. Sketch a triangle in the appropriate quadrant.

★ Don't forget +/- sign depending on quadrant

$\cos(\arcsin\frac{5}{13}) =$ O / H



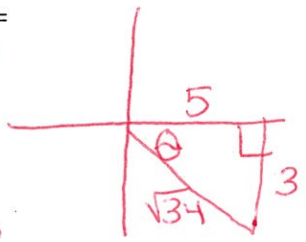
$5^2 + x^2 = 13^2$

$x^2 = 144$

$x = 12$

$\cos = 12/13$ (A/H)

$\sec(\arctan\frac{-3}{5}) =$ O / A



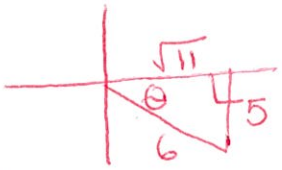
$5^2 + 3^2 = x^2$

$x^2 = 34$

$x = \sqrt{34}$

$\sec = \frac{\sqrt{34}}{5}$ (H/A)

$\tan(\arcsin\frac{-5}{6}) =$ O / H



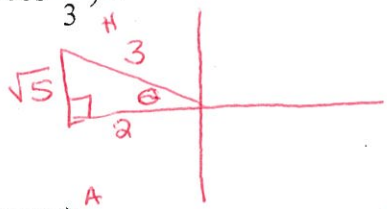
$5^2 + x^2 = 6^2$

$x^2 = 11$

$x = \sqrt{11}$

$\tan = -\frac{5}{\sqrt{11}} = \frac{-5\sqrt{11}}{11}$ (O/A)

$\csc(\arccos\frac{-2}{3}) =$ A / H



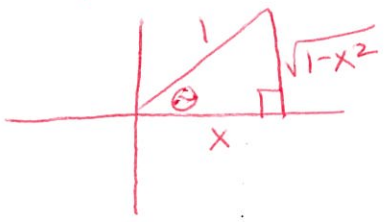
$2^2 + x^2 = 3^2$

$x^2 = 5$

$x = \sqrt{5}$

$\csc = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$ (H/O)

$\cot(\arccos x) =$ A / H



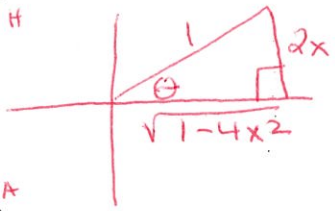
$x^2 + a^2 = 1^2$

$a^2 = 1 - x^2$

$a = \sqrt{1-x^2}$

$\cot = \frac{x}{\sqrt{1-x^2}}$ (A/O)

$\cos(\arcsin 2x) =$ O / H



$(2x)^2 + b^2 = 1^2$

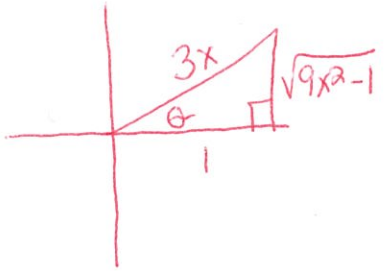
$4x^2 + b^2 = 1$

$b^2 = 1 - 4x^2$

$b = \sqrt{1-4x^2}$

$\cos = \frac{\sqrt{1-4x^2}}{1}$ (A/H)

$\tan(\arccos\frac{1}{3x}) =$ A / H



$1^2 + a^2 = (3x)^2$

$1 + a^2 = 9x^2$

$a^2 = 9x^2 - 1$

$a = \sqrt{9x^2-1}$

$\tan = \frac{\sqrt{9x^2-1}}{1}$ (O/A)