

STUDY GUIDE (SECTION 4.7)

Date _____ Period _____

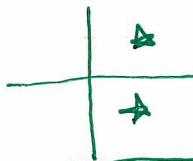
Solve each equation for $0 \leq \theta < 720$.

1) $\frac{-6 + \sqrt{2}}{2} = -3 + \cos \theta$

$$\frac{-6 + \sqrt{2}}{2} = -3 + \cos \theta$$

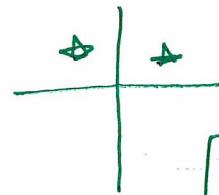
$$-\frac{6}{2} + \frac{\sqrt{2}}{2} = -3 + \cos \theta$$

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



2) $\frac{4 \sin \theta}{4} = \frac{2}{4}$

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



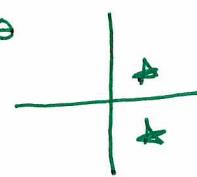
$$\begin{array}{l} 30^\circ, 150^\circ \\ 390^\circ, 510^\circ \end{array}$$

3) $\frac{11}{2} = 5 + \cos \theta$

$$\begin{array}{l} 45^\circ, 315^\circ, 405^\circ \\ 675^\circ \end{array}$$

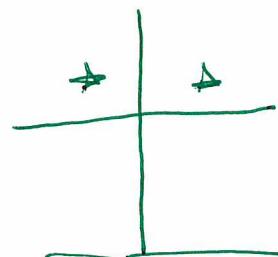
$$\frac{11}{2} - \frac{5}{1} = \cos \theta$$

$$\frac{11}{2} - \frac{10}{2} = \cos \theta$$



4) $-2 + \sin \theta = -\frac{3}{2}$

$$\begin{aligned} \sin \theta &= -\frac{3}{2} + \frac{2}{1} \\ &= -\frac{3}{2} + \frac{4}{2} \end{aligned}$$



5) $5 + \sin \theta = \frac{11}{2}$

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



$$\begin{array}{l} 30^\circ, 150^\circ, \\ 390^\circ, 510^\circ \end{array}$$

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

$$\begin{array}{l} 30^\circ, 150^\circ, 390^\circ, \\ 510^\circ \end{array}$$

Solve each equation for $0 \leq \theta < 4\pi$.

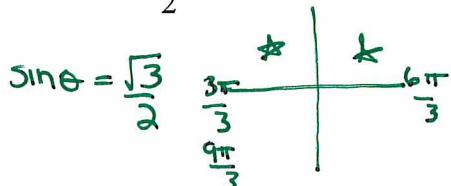
6) $2 + \sin \theta = \frac{3}{2}$

$$\sin \theta = -\frac{1}{2} \quad (\text{IV})$$

$$\sin \theta = \frac{3}{2} - \left(\frac{2}{1}\right)^2$$

$$\sin \theta = \frac{3}{2} - \frac{4}{2}$$

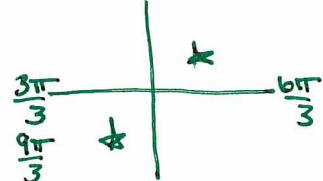
$$8) -\sin \theta = -\frac{\sqrt{3}}{2}$$



$$\begin{array}{l} \frac{7\pi}{6}, \frac{11\pi}{6} \\ \frac{19\pi}{6}, \frac{23\pi}{6} \end{array}$$

7) $-\frac{\sqrt{3}}{-1} = -\tan \theta$

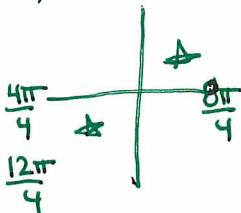
$$\tan \theta = \sqrt{3}$$



$$\begin{array}{l} \frac{\pi}{3}, \frac{4\pi}{3}, \frac{7\pi}{3}, \frac{10\pi}{3} \end{array}$$

9) $2 + \tan \theta = 3$

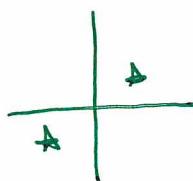
$$\tan \theta = 1$$



$$\begin{array}{l} \frac{\pi}{4}, \frac{5\pi}{4} \\ \frac{9\pi}{4}, \frac{13\pi}{4} \end{array}$$

10) $\frac{1}{5} \cdot \tan \theta = \frac{1}{5}$

$$\tan \theta = 1$$



$$\begin{array}{l} \frac{\pi}{4}, \frac{5\pi}{4} \\ \frac{9\pi}{4}, \frac{13\pi}{4} \end{array}$$

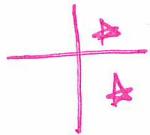
Solve each equation for $0 \leq \theta < 2\pi$. Round your answers to the nearest thousandth.
(Calculator)

(Radian mode)

11) $1 + \cos \theta = 1.55$

$$\cos \theta = .55$$

$$\cos^{-1}(0.55) = .988$$



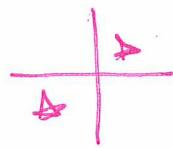
$$.988, 5.295$$

12) $1 + \tan \theta = 3.27$

$$\tan \theta = 2.27$$

$$\tan^{-1}(2.27) = 1.156$$

$$1.156, 4.298$$



$$1.156, 4.298$$

13) $-5 + \tan \theta = 2.62$

$$\tan \theta = 7.62$$

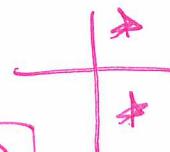
$$\tan^{-1}(7.62) = 1.440$$



14) $0.3 = 2\cos \theta$

$$\cos \theta = .15$$

$$\cos^{-1}(0.15) = 1.420$$



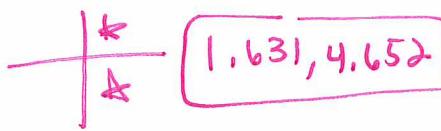
$$1.420, 4.863$$

15) $3.94 = 4 + \cos \theta$

$$\cos \theta = -.06$$

$$\cos^{-1}(-0.06) = 1.631$$

$$1.440, 4.582$$



$$1.631, 4.652$$

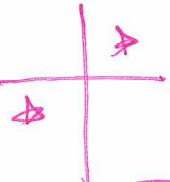
$$1.631, 4.652$$

Solve each equation for $0 \leq \theta < 360$. Round your answers to the nearest thousandth.
(Calculator)

16) $4 + \tan \theta = 6.24$

$$\tan \theta = 2.24$$

$$\tan^{-1}(2.24) = 65.943^\circ$$



$$65.943^\circ, 245.943^\circ$$

17) $-1 + \cos \theta = -1.44$

$$\cos \theta = -.44$$

$$\cos^{-1}(-0.44) = 116.104^\circ$$

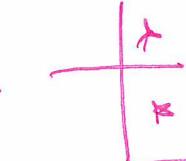


$$116.104^\circ, 243.896^\circ$$

18) $-0.76 = -4\cos \theta$

$$\cos \theta = .19$$

$$\cos^{-1}(0.19) = 79.047^\circ$$

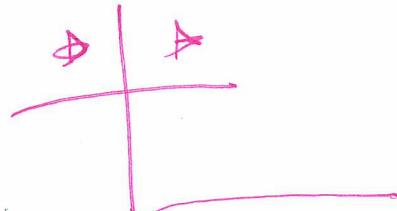


$$79.047^\circ, 286.953^\circ$$

19) $-0.77 = -1 + \sin \theta$

$$\sin \theta = .23$$

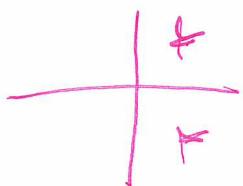
$$\sin^{-1}(0.23) = 13.297^\circ$$



20) $4\cos \theta = 2.28$

$$\cos \theta = .57$$

$$\cos^{-1}(0.57) = 55.250^\circ$$



$$55.250^\circ, 304.750^\circ$$

Evaluate the following without a calculator:

Key

$$\csc(\sqrt{3}/2) = \frac{+}{\downarrow} \quad \boxed{\pi/3}$$

$\sin(\sqrt{3}/2)$

$$\arcsin(-1) = \frac{\pi/2}{\downarrow} \quad \boxed{-\pi/2}$$

$$\arccos(0) = \frac{\pi/2 (0, 1)}{\downarrow} \quad \boxed{\pi/2}$$

$$\arccos(\sqrt{2}/2) = \frac{+}{\downarrow} \cos(\sqrt{2}/2) \quad \boxed{\pi/4}$$

$$\arctan(0) = \frac{\pi/2}{\downarrow} \quad \boxed{0}$$

$$\arctan(-1) = \frac{\pi/2}{\downarrow} \quad \boxed{-\pi/4}$$

$$\arcsin(\sqrt{3}) = \boxed{\text{undefined}}$$

↑
greater than 1

$$\arctan(1) = \frac{\pi/4}{\downarrow} \quad \boxed{\pi/4}$$

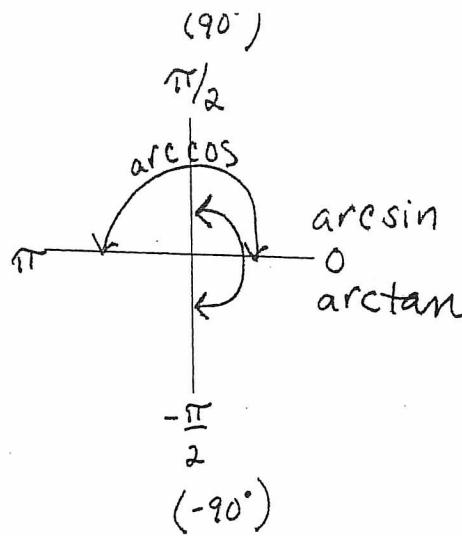
$$\arccos(-\sqrt{2}/2) = \frac{3\pi/4}{\downarrow} \quad \boxed{3\pi/4}$$

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

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

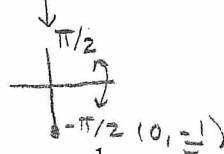
$$\arctan(\sqrt{3}) = \frac{\pi/3}{\downarrow} \quad \boxed{\pi/3}$$

$$\frac{+}{\downarrow}$$

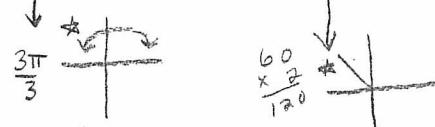


Evaluate each without a calculator:

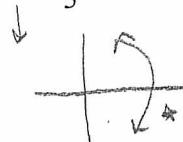
$$\cos(\arcsin(-1)) = \cos(-\pi/2) = 0$$



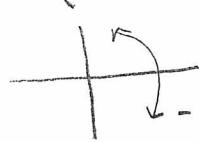
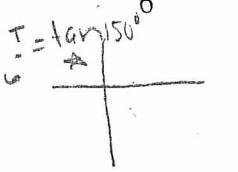
$$\tan(\arccos(-\frac{1}{2})) = \tan(2\pi/3) = -\sqrt{3}$$



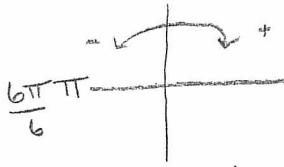
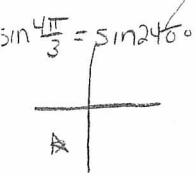
$$\sin(\arctan(-\frac{\sqrt{3}}{3})) = \sin(-\pi/6) = -1/2$$



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

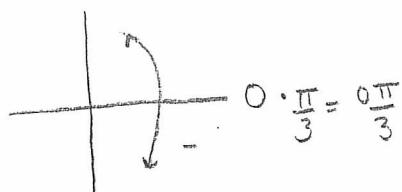
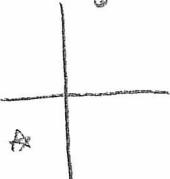


$$\arccos(\sin \frac{4\pi}{3}) = \arccos(-\sqrt{3}/2) = 5\pi/6$$



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

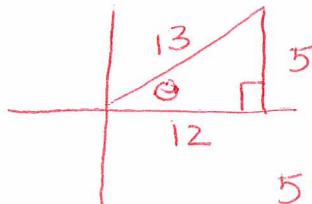
$$\cos \frac{7\pi}{6} = \cos 210^\circ$$



$$0 \cdot \frac{\pi}{3} = \frac{0\pi}{3}$$

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

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



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

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

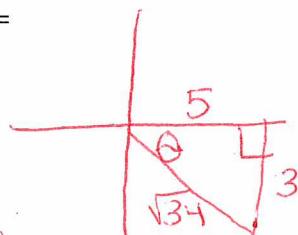
$$x^2 = 144$$

$$x = 12$$

$$\cos = 12/13$$

$$(A/H)$$

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



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

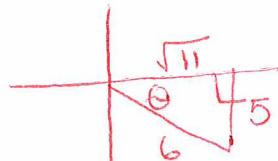
$$x^2 = 34$$

$$x = \sqrt{34}$$

$$\sec = \frac{\sqrt{34}}{5}$$

$$(H/A)$$

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



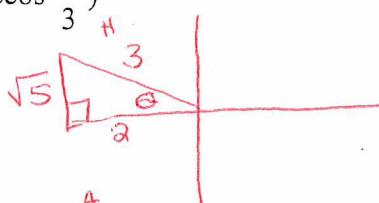
$$5^2 + x^2 = 6^2$$

$$x^2 = 11$$

$$x = \sqrt{11}$$

$$\tan = -\frac{5}{\sqrt{11}} = -\frac{5\sqrt{11}}{11}$$

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



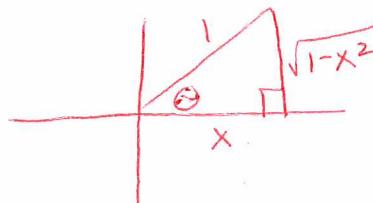
$$2^2 + x^2 = 3^2$$

$$x^2 = 5$$

$$x = \sqrt{5}$$

$$\csc = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$$

$$\cot(\arccos x) =$$



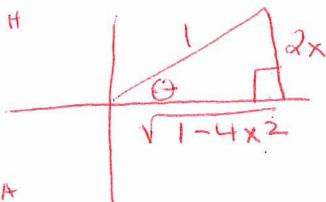
$$x^2 + a^2 = 1^2$$

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

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

$$\cot = \frac{x}{\sqrt{1-x^2}}$$

$$\cos(\arcsin 2x) =$$



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

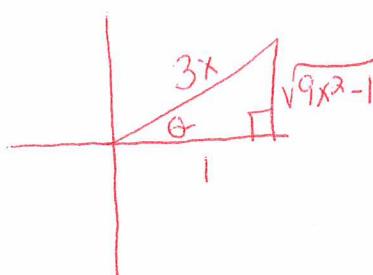
$$4x^2 + b^2 = 1$$

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

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

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

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



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

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

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

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

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