FST Trig Chapter 2 Review   Name _____

1) Convert each of the following to radian measure in terms of π. Show Work.

a) $120°$ $\dfrac{180X}{180} = \dfrac{120\pi}{180}$

$\dfrac{120°}{180°} = \dfrac{X}{\pi}$ $X = \boxed{\dfrac{2\pi}{3} \text{ rad}}$

b) $225°$ $\dfrac{180X}{180} = \dfrac{225\pi}{180}$

$\dfrac{225°}{180°} = \dfrac{X}{\pi}$ $X = \boxed{\dfrac{5\pi}{4} \text{ rad}}$

2) Convert each of the following to degree measure. Show Work.
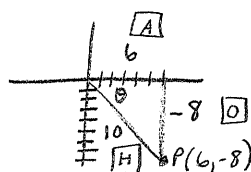
a) $\dfrac{\pi}{4}$ $\dfrac{180}{4} = \boxed{45°}$

b) $\dfrac{7\pi}{2}$ $\dfrac{7(180)}{2} = \dfrac{1260}{2} = \boxed{630°}$

3) Find the **EXACT** value of the six trigonometric functions if the terminal side of θ
contains P (6, -8).

$\sqrt{6^2 + (-8)^2}$
$\sqrt{100}$
$= 10$

SOH CAH TOA

$\sin \theta = \dfrac{-8}{10} = \dfrac{-4}{5}$
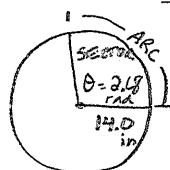
$\cos \theta = \dfrac{6}{10} = \dfrac{3}{5}$

$\tan \theta = \dfrac{-8}{6} = \dfrac{-4}{3}$

$\csc \theta = \dfrac{10}{-8} = \dfrac{5}{-4}$

$\sec \theta = \dfrac{10}{6} = \dfrac{5}{3}$

$\cot \theta = \dfrac{6}{-8} = \dfrac{3}{-4}$

4) In a circle of radius 14.0 in, find the length of the arc subtended by a central angle
AND the area of the circular sector with central angle of 2.68 radians.

ARC $X = 37.52$

$\dfrac{2.68}{2\pi} = \dfrac{X}{2\pi(14)}$ $\boxed{X = 37.5 \text{ in}}$ ARC

$\dfrac{2.68(2\pi)(14)}{2\pi} = \dfrac{2\pi X}{2\pi}$

SECTOR $X = 262.64$

$\dfrac{2.68}{2\pi} = \dfrac{X}{\pi(14)^2}$ $\boxed{X = 263 \text{ in}^2}$ SECTOR

$\dfrac{2.68(\pi)(14)^2}{2\pi} = \dfrac{2\pi X}{2\pi}$

5) Find the **EXACT** value of each without using a calculator. Be sure to sketch the
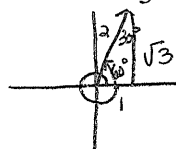reference triangle and find the reference angle.   SOH CAH TOA

a) $\cos\dfrac{3\pi}{4}$ $135°$ $= \dfrac{-1}{\sqrt{2}} \cdot \dfrac{\sqrt{2}}{\sqrt{2}} = \boxed{\dfrac{\sqrt{2}}{2}}$
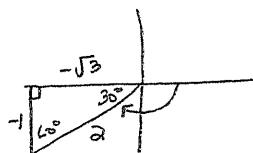

b) $\cot\dfrac{7\pi}{3}$ $420°$ $= \dfrac{A}{O} = \dfrac{1}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}} = \boxed{\dfrac{\sqrt{3}}{3}}$
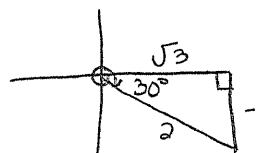

c) $\sin\dfrac{-5\pi}{6}$ $-150°$ $= \boxed{-\dfrac{1}{2}}$
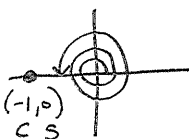

d) $\sec\dfrac{-13\pi}{6}$ $-390°$ $= \dfrac{H}{A} = \dfrac{2}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}} = \boxed{\dfrac{2\sqrt{3}}{3}}$
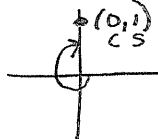

e) $\tan 5\pi$ $= \dfrac{\sin}{\cos} = \dfrac{0}{-1} = \boxed{0}$

$(-1,0)$
C S

f) $\csc\dfrac{-3\pi}{2}$ $-270°$ $= \dfrac{1}{\sin} = \dfrac{1}{1} = \boxed{1}$

$(0,1)$
C S

6) Evaluate each of the following to four significant figures.

a) csc 68°12' Degree

$$\boxed{1.077}\qquad \frac{1}{\sin 68°12'}$$
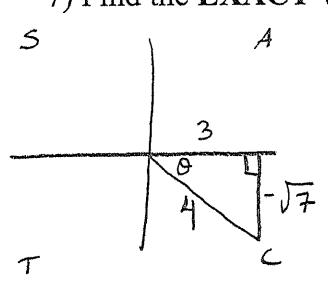
b) cos 0.72 Radian

$$\boxed{0.7518}$$

c) cot 157°36'12" Degree

$$\frac{1}{\tan 157°36'12"}\qquad \boxed{-2.427}$$

7) Find the **EXACT** value of the other five trig functions if $\cos\theta = \dfrac{A\ 3}{H\ 4}$ and $\tan\theta < 0$.

tan is neg.
cos is pos.
Quad IV

$$\sqrt{4^2-3^2} = \sqrt{7}$$

$$\sin\theta = \frac{-\sqrt{7}}{4}$$

$$\cos\theta = \frac{3}{4}$$

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

$$\csc\theta = \frac{-4}{\sqrt7}\cdot\frac{\sqrt7}{\sqrt7} = \frac{-4\sqrt7}{7}$$

$$\sec\theta = \frac{4}{3}$$

$$\cot\theta = \frac{-3}{\sqrt7}\cdot\frac{\sqrt7}{\sqrt7} = \frac{-3\sqrt7}{7}$$

8) Find all angles exactly between 0 and 2π for which $\sin\theta = \dfrac{-\sqrt2}{2}$.

☆ Use unit circle $\left(\cos,\ -\dfrac{\sqrt2}{2}\right)$

$$\boxed{\frac{5\pi}{4}\ )\ \frac{7\pi}{4}}$$

9) Simplify each of the following expressions using the fundamental identities: Show your Work.

a) $\cot\theta \cdot \sec\theta$

$$\frac{\cos\theta}{\sin\theta}\cdot\frac{1}{\cos\theta} = \frac{1}{\sin\theta}$$

$$= \boxed{\csc\theta}$$

b) $\dfrac{\cos\theta}{1-\sin^2\theta} = \dfrac{\cos\theta}{\cos^2\theta}$

$$= \frac{\cos\theta}{\cos\theta\cdot\cos\theta}$$

$$= \frac{1}{\cos\theta} = \boxed{\sec\theta}$$

10) Find the **EXACT** value of x and y in each of the following triangles.

a)

$$\frac{x\sqrt3}{\sqrt3} = \frac{5\ cm}{\sqrt3}$$

$$x = \frac{5\cdot\sqrt3}{\sqrt3\cdot\sqrt3}$$

$$x = \frac{5\sqrt3}{3}$$

$$\boxed{x = \frac{5\sqrt3}{3}\ cm}$$

$$\boxed{y = \frac{10\sqrt3}{3}\ cm}$$

$$y = \left(\frac{2}{1}\right)\left(\frac{5\sqrt3}{3}\right)$$

$$y = \frac{10\sqrt3}{3}$$

b)

$$\boxed{3\sqrt3 = x\ cm}$$

$$\boxed{y = 6\ cm}$$

3 cm

c)

$$\frac{11\ cm}{\sqrt2} = \frac{x\sqrt2}{\sqrt2}$$

$$x = \frac{11}{\sqrt2}\cdot\frac{\sqrt2}{\sqrt2}$$

$$x = \frac{11\sqrt2}{2}$$

$$\boxed{x = \frac{11\sqrt2}{2}\ cm}$$

$$\boxed{\frac{11\sqrt2}{2} = y\ cm}$$