S | A
T | C

(0,1) 1 3 2
65° π/3 2
45° π/4 3 1
30° π/6 (1,0)

arcsin [Domain $[-1,1]$, Range $[-\pi/2, \pi/2]$] arccos [Domain $[-1,1]$, Range $[0, \pi]$]
arctan [Domain $\forall \mathbb{R}$ #s, Range $(-\frac{\pi}{2}, \frac{\pi}{2})$]

Name: Key

Pre-Cal

Review Section 4.7

*Evaluate the expression **without** the aid of a calculator.*

1. $\arcsin\left(\frac{\sqrt{3}}{2}\right) = \pi/3$
2. $\arccos\left(-\frac{\sqrt{3}}{2}\right) = \frac{5}{6}\pi$
3. $\tan^{-1}\left(\frac{\sqrt{3}}{3}\right) = \frac{\pi}{6}$
4. $\arccos 1 = 0$
5. $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = -\frac{\pi}{4}$
6. $\arctan\left(-\sqrt{3}\right) = -\frac{\pi}{3}$

Solve the equation in $[0, 2\pi]$. 7. $\csc x = 2/\sqrt{3}$

$\sin x = \sqrt{3}/2$

7. $\sqrt{3}\csc x - 2 = 0$ $\boxed{x = \pi/3 \text{ and } \frac{2}{3}\pi}$

8. $4\cos^2 x - 1 = 0$ 8. $\cos^2 x = 1/4$ $\cos x = \pm 1/2$

$\boxed{x = \frac{\pi}{3}, \frac{2}{3}\pi, \frac{4}{3}\pi, \frac{5}{3}\pi}$

Find all the solutions for:

9. $\tan 2x = -\frac{\sqrt{3}}{3}$ $2x = \frac{5}{6}\pi$ $2x = \frac{11}{6}\pi$

Period $\frac{\pi}{b} = \boxed{\frac{\pi}{2}}$

$\boxed{x = \frac{5}{12}\pi + \frac{\pi}{2}k \quad x = \frac{11}{12}\pi + \frac{\pi}{2}k}$ where k is an integer

10. *Why do inverse trig functions have only one solution?* Inverse function are one to one, there is only one y for every x and one x for every y value.

Write an algebraic expression that is equivalent to the expression using a right Δ.

11. $\cos\left[\arctan\left(\frac{\sqrt{3}}{x}\right)\right]$

$\cos(\arctan(\frac{\sqrt{3}}{x})) = \frac{x}{\sqrt{x^2+3}}$

$x^2 + \sqrt{3}^2 = c^2$

$c = \sqrt{x^2+3}$

Use the properties of inverse trig functions to evaluate the expressions.

12. $\tan(\arctan 1) =$

$\tan(\pi/4) = \boxed{1}$

13. $\arccos\left[\cos\left(\frac{5}{6}\pi\right)\right] =$

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

14. $\sin(\arcsin 0.5) =$

$\sin(\frac{\pi}{6}) = \boxed{1/2}$

15. $\arcsin\left[\sin\left(\frac{5}{4}\pi\right)\right]$

$\arcsin(-\sqrt{2}/2) = \boxed{-\pi/4}$

16. $\arcsin\left[\sin\left(\frac{9}{4}\pi\right)\right] = \boxed{\pi/4}$

$\arcsin(\sqrt{2}/2)$

17. $\tan^{-1}\left[\tan\left(-\frac{7}{6}\pi\right)\right] = -\pi/6$

$\tan^{-1}(-\sqrt{3}/3)$

18. $\arccos\left[\cos\left(-\frac{5}{4}\pi\right)\right] = \boxed{\frac{3}{4}\pi}$

$\arccos(-\sqrt{2}/2)$

Find the exact value of the expression.

19. $\sec\left[\arctan\left(-\frac{6}{8}\right)\right] = \boxed{\frac{10}{8}}$ $\frac{1}{\cos}$

$\sec\theta = \frac{H}{A}$

c, −6, θ, 8

$c^2 = 8^2 + (-6)^2$

$c = 10$

20. $\sin\left[\arccos\left(-\frac{12}{13}\right)\right] = \boxed{\frac{5}{13}}$

$\sin\theta = \frac{5}{13}$

13, 5, θ, −12 $13^2 + a^2 = 25$ $a = 5$

21. $\csc\left[\operatorname{arccot}\left(\frac{7}{4}\right)\right] = \boxed{\frac{\sqrt{65}}{4}}$ $\frac{1}{\sin}$

c, 4, u, 7 $4^2 + 7^2 = c^2$

$\sqrt{65} = c$

$\csc\theta = \frac{H}{Opp}$

$\csc\theta = \frac{\sqrt{65}}{4}$

Pre Calculus Name_______________

Solve Trig Equations 4.7 #2

Solve each equation

1) $\sin \theta = 1$

$\theta = \frac{\pi}{2} + 2\pi k$, where k is an integer

2) $-1 = \cos \theta$

$\theta = \pi + 2\pi k$, where k is an integer

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

$\theta = \frac{\pi}{4} + 2\pi k$
$\theta = \frac{3\pi}{4} + 2\pi k$, where k is an integer

4) $\csc \theta = 2$

$\theta = \frac{\pi}{6} + 2\pi k$
$\theta = \frac{5\pi}{6} + 2\pi k$, where k is an integer