

arcsin [Domain [-1,1], Range [-pi/2, pi/2]]  
 arccos [Domain [-1,1], Range [0, pi]]  
 arctan [Domain R, Range (-pi/2, 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.  $\arccos\left(-\frac{\sqrt{3}}{2}\right) = 5\pi/6$

3.  $\tan^{-1}\left(\frac{\sqrt{3}}{3}\right) = \pi/6$

4.  $\arccos 1 = 0$

5.  $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = -\pi/4$

6.  $\arctan(-\sqrt{3}) = -\pi/3$

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

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

8.  $4 \cos^2 x - 1 = 0$   
 $\cos^2 x = 1/4$   
 $\cos x = \pm 1/2$   
 $x = \pi/3, 2\pi/3, 4\pi/3, 5\pi/3$

Find all the solutions for:

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

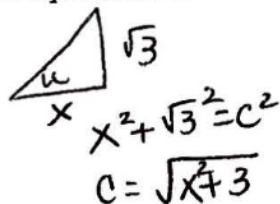
Period  $\frac{\pi}{b} = \frac{\pi}{2}$

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

10. Why do inverse trig functions have only one solution? Inverse functions 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  $\Delta$ .

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



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

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

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

$\tan(\pi/4) = 1$

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

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

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

$\sin(\pi/6) = 1/2$

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

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

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

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

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

$\tan^{-1}(-\sqrt{3}/3) = -\pi/6$

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

$\arccos(-\sqrt{2}/2) = 3\pi/4$

Find the exact value of the expression.

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



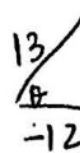
$\sec \theta = \frac{H}{A}$

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

$c = 10$

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

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



$13^2 = a^2 + 12^2$   
 $a = 5$

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

str

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



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

$\sqrt{65} = c$

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

## Solve Trig Equations 4.7 #2

Solve each equation

1)  $\sin \theta = 1$

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

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

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

2)  $-1 = \cos \theta$

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

4)  $\csc \theta = 2$

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