4.7

Thursday, March 7, 2019 8:13 AM

Pre-Calc WS
Section 4.7

Name _____

Complete the two charts below without using your calculator.

	Domain	Range	Quadrants
$\sin^{-1}\theta$	$[-1,1]$	$[-\frac{\pi}{2},\frac{\pi}{2}]$	I, IV
$\cos^{-1}\theta$	$[-1,1]$	$[0,\pi]$	I II
$\tan^{-1}\theta$	$(-\infty,\infty)$	$(-\frac{\pi}{2},\frac{\pi}{2})$	I IV
$\csc^{-1}\theta$	$(-\infty,-1]\cup[1,\infty)$	$[-\frac{\pi}{2},0)\cup(0,\frac{\pi}{2}]$	I IV
$\sec^{-1}\theta$	$(-\infty,-1]\cup[1,\infty)$	$[0,\frac{\pi}{2})\cup(\frac{\pi}{2},\pi]$	I II
$\cot^{-1}\theta$	$(-\infty,\infty)$	$(0,\pi)$	I II

Without using your calculator, evaluate the following. (Draw a picture if needed.)

1) $\cos^{-1}\left(\frac{\sqrt{2}}{2}\right) = \frac{\pi}{4}$

2) $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) = \frac{5\pi}{6}$

3) $\tan^{-1}(-1) = -\frac{\pi}{4}$

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

$\frac{\sqrt{3}}{3}$ $\frac{1}{\sqrt{3}}$

5) $\arcsin\left(-\frac{\sqrt{3}}{2}\right) = -\frac{\pi}{3}$

6) $\cot\left[\sin^{-1}\left(\frac{1}{2}\right)\right]$ $\cot\left(\frac{\pi}{6}\right) = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$

7) $\sin\left(\cos^{-1}\frac{1}{2}\right)$

$\sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$

8) $\tan\left[\sin^{-1}\left(-\frac{1}{2}\right)\right]$

$\tan\left(-\frac{\pi}{6}\right) = \frac{-1/2}{\sqrt{3}/2} = -\frac{1}{\sqrt{3}}$

9) $\sec\left(\arccos\frac{1}{2}\right)$

$\sec\left(\frac{\pi}{3}\right) = 2$

10) $\csc\left(\tan^{-1}1\right)$

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

11. $\sin^{-1}\left(\cos\frac{7\pi}{4}\right)$

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

12. $arc\cot\left(\csc\left(-\frac{\pi}{6}\right)\right)$

$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

$\sin^{-1}\left(\sin\frac{7\pi}{4}\right)$

$-\pi/4$

careful

Use your calculators to evaluate the following. Round your answer to the nearest hundredth.

13) $\cot^{-1}(-6.1)$

2.432

14) $\cos^{-1}\left(\frac{2}{3}\right)$

15) $\sec^{-1}(1.99)$

16) $\tan^{-1}\left(\frac{5}{7}\right)$

New type of problem...

Find an algebraic expression equivalent to the given expression.

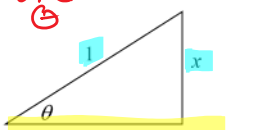
$\cos\left(\sin^{-1}x\right)$

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

$\tan\theta = 5$

$\tan\theta = \frac{5}{1}$

$\sin^{-1}x$ $\sin^{-1}\frac{x}{1}$



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

Steps:

1) Draw a right triangle

2) Make $\sin\theta = x$ WHY?? _____

3) Solve for missing side using Pythagorean Theorem

4) Evaluate original problem.

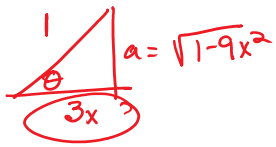
1) $\cos\left(\tan^{-1}x\right)$

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

$a^2 = 1 - x^2$

2) $\cot\left(\arccos x\right)$

3) $\sin(\arccos(3x))$



$\cos\theta = \frac{3x}{1}$

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

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