Keep/make this or something like it.

https://harryzaims.com/122/122-fall-22/cheat-sheet-test-2.pdf

A graphing calculator that gives more precision

https://www.geogebra.org/graphing?lang=en

Check your e-mail. I e-mailed you a snippet of spreadsheet with your current grade.

I gave everybody the e-mail settings, but will be checking those, later. 5% of your grade.

Attendance: Everybody but one student got 100%, until I drill deeper. It's only 5% of your grade.

60% Tests

30% Homework

$.6T + .3H + .05E + .05A$

All homeworks weigh the same.

30. 0/1 points

Write the trigonometric expression as an algebraic expression.

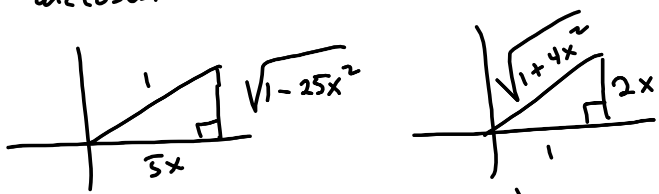
$\cos(\arccos 5x - \arctan 2x) = \cos(u - v)$

✖ $\dfrac{2\sqrt{1-25x^2}\,x + 5x}{\sqrt{4x^2+1}}$

$= \cos u \cos v + \sin u \sin v$

$= \cos(\arccos(5x)) \cos(\arctan(2x)) + \sin(\arccos(5x)) \sin(\arctan(2x))$

arccos(5x) arctan(2x) Assume QI



$= (5x)\left(\dfrac{1}{\sqrt{4x^2+1}}\right) + \left(\sqrt{1-25x^2}\right)\left(\dfrac{2x}{\sqrt{4x^2+1}}\right)$

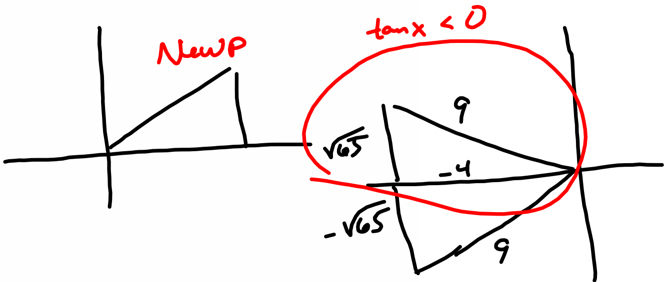
$= \dfrac{5x + 2x\sqrt{1-25x^2}}{\sqrt{4x^2+1}}$

7. 0/6 points

Use the given conditions to find the values of all six trigonometric functions. (If an answer

$\boxed{\sec(x) = -\frac{9}{4}}$, $\tan(x) < 0$

$\sin(x) =$	✗	$\frac{\sqrt{65}}{9}$
$\cos(x) =$	✗	$-\frac{4}{9}$
$\tan(x) =$	✗	$-\frac{\sqrt{65}}{4}$
$\csc(x) =$	✗	$\frac{9}{\sqrt{65}}$
$\sec(x) =$	✗	$-\frac{9}{4}$
$\cot(x) =$	✗	$-\frac{4}{\sqrt{65}}$



$\sqrt{9^2 - 4^2} = \sqrt{81-16} = \sqrt{65}$

$\sqrt{9^2 - (-4)^2}$

10. 0/1 points LarTrig10 2.1.030. [388221

Factor the expression. Use the fundamental identities to simplify, if necessary. (There is more than one correct form of eac answer.)

$15\cos^2(x) + 17\cos(x) - 4$

✗ $(3\cos(x) + 4)(5\cos(x) - 1)$

$15u^2 + 17u - 4$

$(15)(-4) = -(3)(5)(2)(2)$

$20 - 3 = 17$

$15u^2 + 20u - 3u - 4$

$= 5u(3u+4) - 1(3u+4) = 5u\Delta - 1\Delta = \Delta(5u-1)$

$= (3u+4)(5u-1) = (3\cos x + 4)(5\cos x - 1)$

$(15)(-4) = -60 = \text{Magic } \#$

$+\ 17 = 18 - 1 \qquad -18$

$= 19 - 2 \qquad -38$

$= 20 - 3 \qquad -60$ sweet!

$5u^2 + 20u - 3u - 4$ etc.

Sledge hammah:

$b^2 - 4ac = (17)^2 - 4(15)(-4) = 289 + 240 = 529 = 23^2$, so

$a = 15$

$b = 17$

$c = -4$

$$u = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-17 \pm 23}{2(15)} \quad \frac{6}{30} = \frac{1}{5}, \quad \frac{-40}{30} = -\frac{4}{3} \Rightarrow$$

$$15u^2 + 17u - 4 = 15\left(u - \frac{1}{5}\right)\left(u + \frac{4}{3}\right)$$

$$= (5u - 1)(3u + 4)$$

$x^2 = 2 \Rightarrow x = \pm\sqrt{2}$

$\Rightarrow x^2 - 2 = (x - \sqrt{2})(x + \sqrt{2})$

$x^2 = -2 \Rightarrow$

$x = \pm\sqrt{-2} = \pm i\sqrt{2} \Rightarrow$

$x^2 + 2 = (x - i\sqrt{2})(x + i\sqrt{2})$

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

$(a-b)(a+b)=a^2-b^2$

$LCD = (1+\sin(x))(1-\sin(x)) = 1-\sin^2 x = \cos^2 x$

$$= \frac{\cos x - \sin x\cos x - [\cos x + \cos x \sin x]}{LCD} = \frac{\cos x - \sin x\cos x - \cos x - \sin x\cos x}{LCD}$$

$$= \frac{-2\sin x\cos x}{\cos^2 x} = -\frac{2\sin x}{\cos x} = -2\tan x$$

15. 0/3 points

This is in previous

Verify the identity. (Simplify at each step.)

$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \frac{1+\sin\theta}{|\cos\theta|}$$

0/1 points LarTrig10 2.3.003. [3882142]

Fill in the blank.

The equation $2\tan^2(x) - 3\tan(x) + 1 = 0$ is a trigonometric equation of [ ] ✖ quadratic type.

Quadratic in tangent

Solve:

$14\tan^2 x + 21\tan x + 7 = 0 \Rightarrow$

$2\tan^2 x + 3\tan x + 1 = 0$. Let $u = \tan x$.

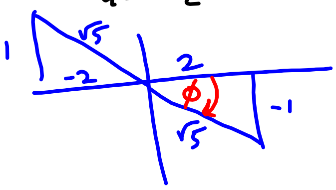
$(2u+1)(u+1) = 0 \rightarrow$

$2u+1=0$ $\qquad$ $u=-1=\tan x$

$2u=-1$ $\qquad$ FIND EXACT answer.

$u=-\frac{1}{2}=\tan x$

$\phi = \arctan\left(-\frac{1}{2}\right) = -\arctan\left(\frac{1}{2}\right)$



$\sqrt{1^2+2^2}=\sqrt{5}$

$2\pi + \arctan\left(-\frac{1}{2}\right) + n\pi \quad \forall\, n \in \mathbb{Z}$

$2\pi - \arctan\left(\frac{1}{2}\right) + n\pi \quad$ " " " "

$\pi - \arctan\left(\frac{1}{2}\right) + n\pi \quad \ldots$

any one of these

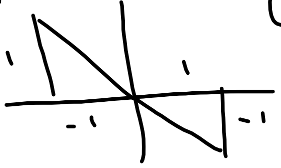
$\arctan\left(\frac{1}{2}\right)$ is irrational

$\mathbb{Q}$ = Rationals = $\left\{ \frac{a}{b} \;\middle|\; a,b \in \mathbb{Z} \text{ and } b \neq 0 \right\}$

$\mathbb{R}$ = Reals

$\mathbb{I}$ = Irrationals = $\mathbb{R} \setminus \mathbb{Q}$

Also $\tan(x) = -1$



$\boxed{x = \frac{3\pi}{4} + n\pi, \quad n \in \mathbb{Z}}$

$= -\frac{\pi}{4} + n\pi, \quad n \in \mathbb{Z}$

Power-Reducing

$$\cos^4 u = \left(\cos^2(u)\right)^2 = \left(\frac{1+\cos(2u)}{2}\right)^2$$

$$= \frac{1}{4}\left[\cos^2(2u) + 2\cos(2u) + 1\right]$$

$$= \frac{1}{4}\left[\frac{1+\cos(4u)}{2} + 2\cos(2u) + 1\right]$$

$$= \frac{1}{8} + \frac{1}{8}\cos(4u) + \frac{2\cos(2u)}{4} + \frac{1}{4}$$

$$= \frac{1}{8}\cos(4u) + \frac{1}{2}\cos(2u) + \frac{3}{8}$$

HALF-ANGLE:

$$\sin\left(\frac{u}{2}\right) = \pm\sqrt{\frac{1-\cos(u)}{2}} \Rightarrow \sin^2(u) = \frac{1-\cos(2u)}{2}$$

$$\cos\left(\frac{u}{2}\right) = \pm\sqrt{\frac{1+\cos(u)}{2}} \Rightarrow \cos^2(u) = \frac{1+\cos(2u)}{2}$$