Section 2: Introduction to Trigonometric Identities

Everyone at your table should take out your graphing calculators. Did one of you forget it? TEN LASHES WITH A WET NOODLE.

Each person should take a different <u>one</u> of these equations and enter it into Y1. DON'T GRAPH IT THOUGH. Double check your equation to make sure you didn't mis-enter anything or forget a parentheses!

Now **BEING SURE TO HIDE YOUR GRAPH FROM THE REST OF YOUR MISCREANT GROUP MEMBERS** use ZOOM TRIG and graph. THIS IS FOR YOUR EYES ONLY.

A. $y=\tan\left(x+\frac{\pi}{4}\right)+1$	B. $y=\sqrt{2}\cos(x)\sec\left(x+\frac{\pi}{4}\right)$
C. $y=\frac{2\cos(x)}{\cos(x)-\sin(x)}$	D. $y=1+\frac{1+\tan(x)}{1-\tan(x)}$

Okay, are you all graphed? On the count of three there will be the big reveal.
One…

TWO…

REVEAL!

Whoa. Really? REALLY?

Yes, really.

The reason this is happening is because: _____

_____.

1. Think *independently* (not in your group). What do you suspect will happen if you graph: $y=\frac{\sin^2(x)}{1-\cos^2(x)}$

2. Everyone in your group share your conjecture.

3. Everyone in the group should graph this function (ZOOM TRIG!). You can enter $\sin^2(x)$ by either typing $(\sin(x))(\sin(x))$ or $(\sin(x))\text{^}2$. Are you surprised by what you see? Now that you see it, can you explain what is showing up?

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What this all is showing you is that sometimes two functions are **equal** even if their equations look very different. They are **identical** to each other. You've seen this a million times before…

For example: $y=(x^2+3)^2$ and $y=x^4+6x^2+9$ are the exact same when graphed. The points which make one true also are the same points that make the second one true. The way you can see that is by simple algebraic manipulation.

We call two expressions which look different but are essentially the same "**identities**." Duh, they are identical. Since we are dealing with trigonometry, we call identities with trigonometry (this is really shocking… ready?): **trigonometric identities.**

Check yo'self: Graph the following **on geogebra** and see if you can't generate simple trigonometric identities:

(a) $y=\tan(x)\cot(x)$ is equivalent to _____

(b) $y=\dfrac{\cot x}{\csc x}$ is equivalent to _____

(c) $y=\sec(x)\sin(x)$ is equivalent to _____

Check yo'self twice:

Are the following two equations **identical**? Graph them on geogebra to find out.

(a) $y=\dfrac{1-\sin(x)}{\cos(x)}-\dfrac{\cos(x)}{1+\sin(x)}$ and $y=\tan x$? YES / NO

(b) $y=\ln|\tan x|$ and $y=\ln|\sin x|-\ln|\cos x|$?[1] YES / NO

(c) $y=4(3)^2\dfrac{(\csc x-1)(\sec x+\tan x)}{\csc x\sec x}$ and $y=(2\cdot 3\cos x)^2$? YES / NO

(d) $y=\dfrac{\sin^3 x+\cos^3 x}{\sin x+\cos x}$ and $y=\sin x\cos x$? YES / NO

As we go through the next few days, we will be working to verify some identities are true.

Home Enjoyment:
Section 8.1#19, 20, 22, 25, 26, 27
Section 7.3 #9-18 (all) [Example 1 from the section should help you]

[1] Absolute value in geogebra is as follows: abs(x)

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