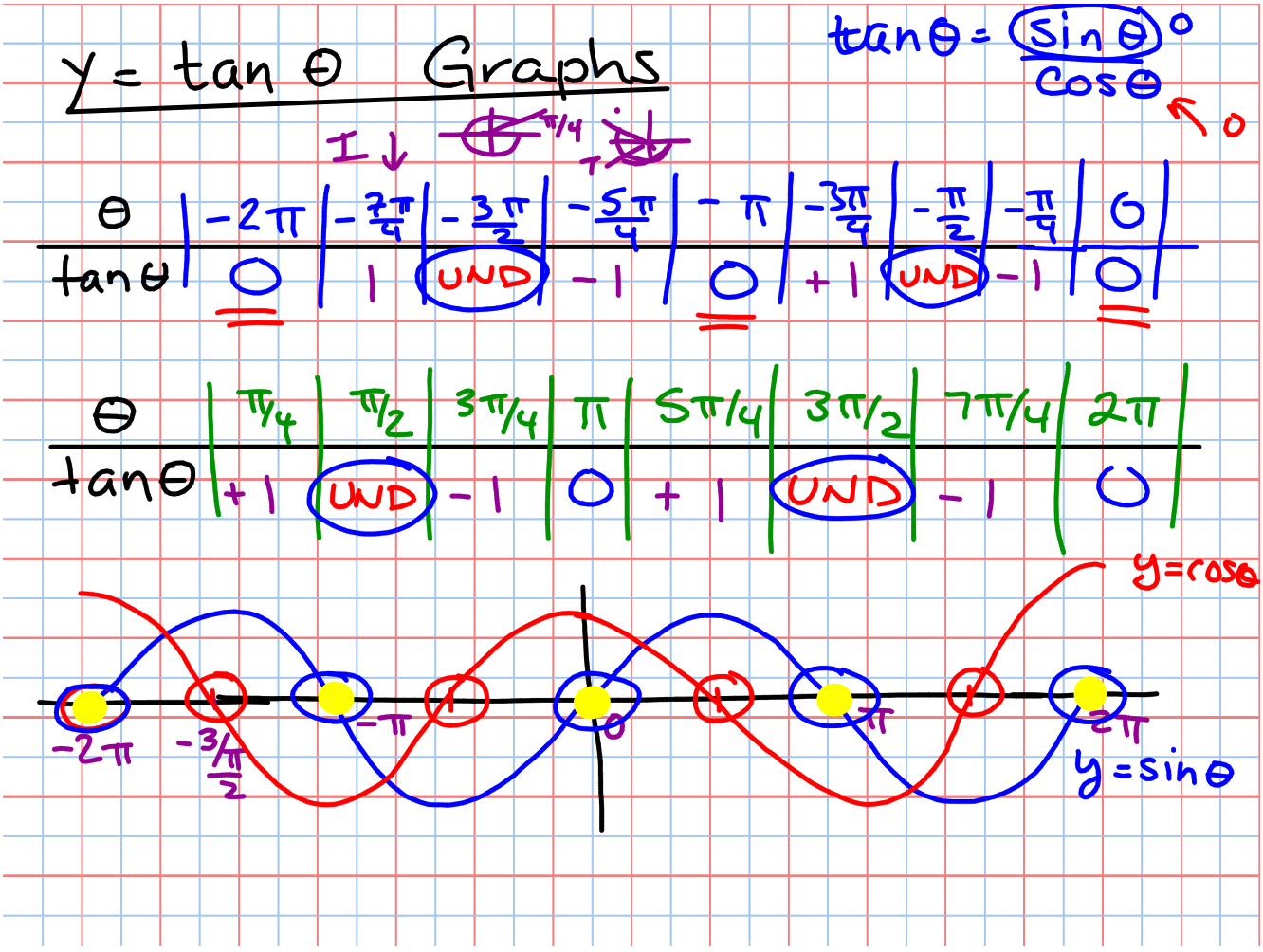
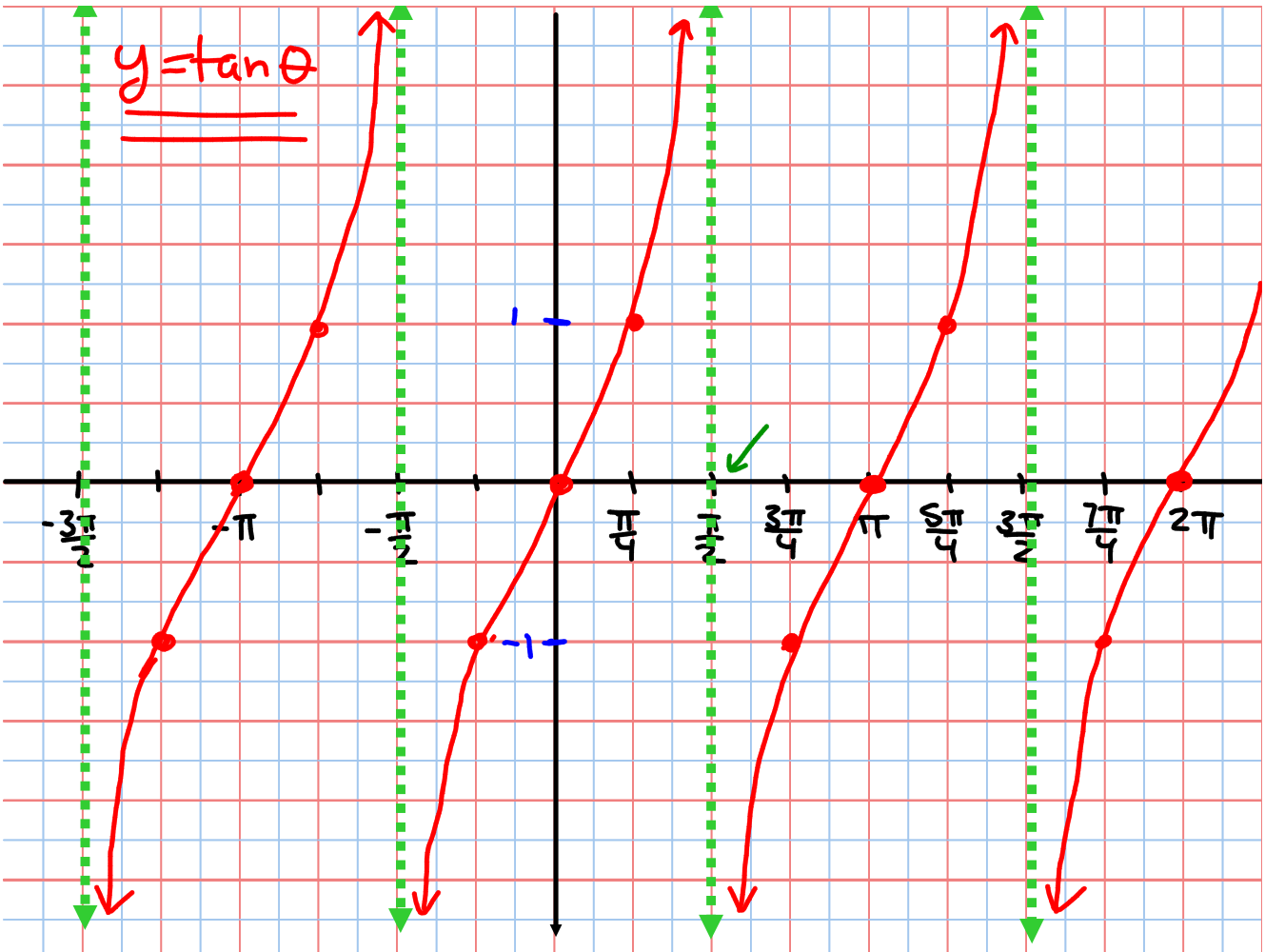
To Do List

(1) ✓ Graphing worksheets are due ASAP ⇒ By Wednesday for sure.

(2) ✓ Tan Graphs

(3) Trig Identities


y = tan θ Graphs
tanθ = sinθ / cosθ
cosθ ↖ 0
I ↓
π/4
θ | -2π | -7π/4 | -3π/2 | -5π/4 | -π | -3π/4 | -π/2 | -π/4 | 0
tanθ | 0 | 1 | UND | -1 | 0 | +1 | UND | -1 | 0
θ | π/4 | π/2 | 3π/4 | π | 5π/4 | 3π/2 | 7π/4 | 2π
tanθ | +1 | UND | -1 | 0 | +1 | UND | -1 | 0
y=cosθ
y=sinθ
-2π
-3π/2
-π
0
π
2π



Range: $y \in \mathbb{R}$

Domain: $x \neq \frac{\pi}{2} + \pi n$ where $n \in \mathbb{I}$

Period for $\tan\theta$ is π or $180°$

$$y = \overset{a}{2}\tan\overset{b}{3}(x \overset{c}{+0}) \overset{d}{+0}$$

Tan θ does NOT have an amplitude!

a=2 is a vertical stretch by a factor of 2

Period $= \frac{\pi}{b} = \frac{\pi}{3}$

$\frac{\frac{1}{2}}{\frac{2}{3}} = \frac{1}{2}\cdot\frac{3}{2} = \frac{3}{4}$

$\frac{\left(\frac{2}{3}+\frac{5}{3}\right)}{\frac{8}{3}} = \frac{\frac{7}{3}}{\frac{8}{3}} = \frac{7}{3}\cdot\frac{8}{8} = \frac{7}{8}$

$\frac{3-x}{x-3} = \frac{-1(-3+x)}{(x-3)} = \frac{-1(x-3)}{(x-3)} = -1$

$\frac{+1-\cos\theta}{+\cos\theta-1} = -1$

$\frac{\frac{2x}{x}-\frac{1}{x}}{\frac{1}{2}-\frac{2x}{2}} = \frac{\frac{2x}{x}-\frac{1}{x}}{\frac{1}{2}-\frac{2x}{2}} = \frac{(2x-1)}{x} \div \frac{(1-2x)}{2} = \frac{(2x-1)}{x}\cdot\frac{2}{(1-2x)} = \frac{-2}{x}$

x by 1 $\Rightarrow \frac{x}{x}$, $\frac{3x^2}{3x^2}$, $\frac{\cos\theta+1}{\cos\theta+1}$

add zero $\rightarrow \cos\theta - \cos\theta$

$2-2$

$\frac{x}{x-1}x - \frac{1}{x} = \frac{x^2-1}{x}$ done or $\frac{(x-1)(x+1)}{x}$

$(1-x)(1+x) = 1-x^2$

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

$(a-b)(a-b)$

$= a^2 - 2ab + b^2$

$\frac{1}{2}\left(\frac{2}{5}-\frac{8}{9}\right) = \frac{9}{9}\frac{1}{5} - \frac{4}{9}\cdot\frac{5}{5} = \frac{9}{45}\frac{-20}{45}$

$= \frac{-11}{45}$

$\frac{1}{5}+\frac{3}{7} = \frac{7}{35}+\frac{15}{35} = \frac{22}{35}$

$\frac{\frac{a}{b}}{\frac{c}{1}} = \frac{a}{b}\cdot\frac{1}{c} = \frac{a}{bc}$

$\frac{\frac{3}{7}}{\frac{2}{1}} = \frac{3}{14}$

$\frac{\cos\theta-1}{\frac{\sin\theta}{\cos\theta}} = \frac{\cos\theta-1}{\sin\theta\cos\theta}$

$\frac{3}{7}\cdot\frac{1}{2} = \frac{3}{14}$

$\frac{a}{\frac{b}{c}} = \frac{a}{1}\cdot\frac{c}{b} = \frac{ac}{b}$

$\frac{\frac{a}{b}}{\frac{c}{b}} = \frac{ab}{cb}$

What the heck is an identity?!

In an equation we are looking for the specific value(s) of the variable that make the equation true

Ex: $3x + 5 = 8$

$-5 \quad -5$

$\frac{3x}{3} = \frac{3}{3}$

$x = 1$

In an Identity we are trying to prove that the stated relationship is true for all values (except sometimes specific restrictions) of the variable.

Ex 1

LS = RS

- mult by 1
- use arithmet.
- add zero

$1 + \tan^2\theta = \sec^2\theta$

$\frac{\cos^2\theta}{\cos^2\theta}\frac{1}{1} + \frac{\sin^2\theta}{\cos^2\theta}$

$\frac{\cos^2\theta + \sin^2\theta}{\cos^2\theta}$

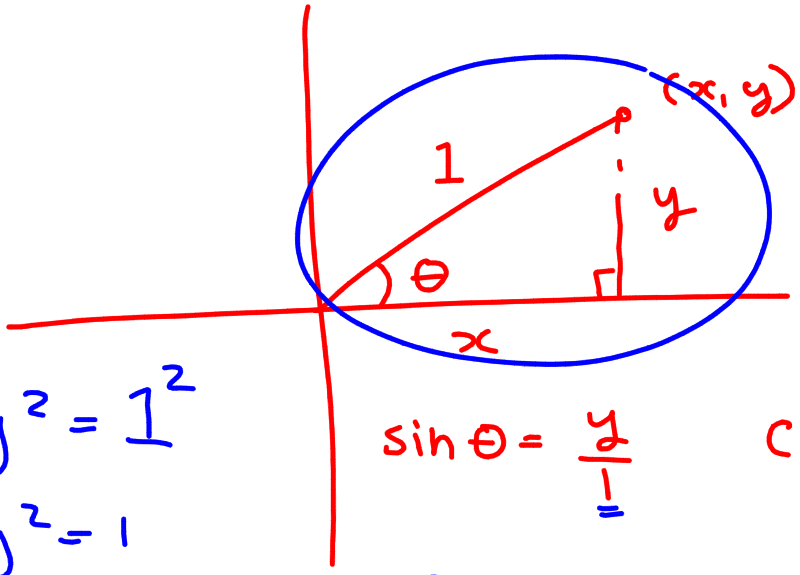
$\frac{1}{\cos^2\theta}$

$\sec^2\theta = \sec^2\theta$

LS = RS

Q.E.D

There I did it!



$x^2+y^2=1^2$

$x^2+y^2=1$

$(\cos\theta)^2+(\sin\theta)^2=1$

$\cos^2\theta+\sin^2\theta=1$

$\sin\theta=\frac{y}{1}$

$\sin\theta=y$

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

$\cos\theta=x$

$\cos^2\theta + \sin^2\theta = 1$

$-\sin^2\theta \quad -\sin^2\theta$

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

Conjugate pairs

$\sin^2\theta = 1 - \cos^2\theta$

Now... go back to $y = \tan\theta$ & do the assignment for Section 5.3.

Tomorrow: Identities, identities, identities!!

Th/Fri: Work

Mon: Trig Applications

Tues/Wed Review

Thurs May 29th → Ch 5/6 Test...