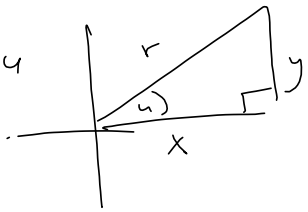
$$\frac{\sin\theta}{\cos\theta} = \frac{\frac{y}{r}}{\frac{x}{r}} = \frac{y}{r}\cdot\frac{r}{x} = \frac{y}{x} = \tan\theta$$



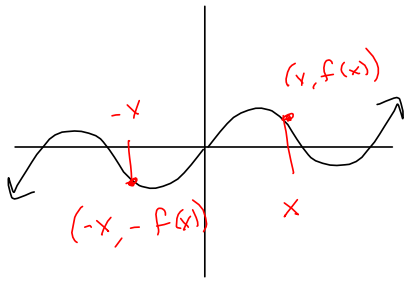
§2.1 #s 1–6

ODD FUNCS

$f(-x) = -f(x)$

$\sin x$, $\tan x$, $\csc x$

$x^3, x^5, x^{2n+1}, \ldots$

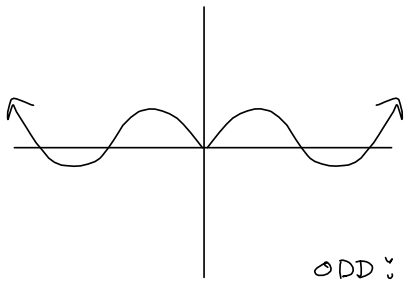


Even Functions

$f(-x) = f(x)$

$\cos x$, $\sec x$

$x^2, x^4, x^{2n}, \ldots$



ODD: −

EVEN: +

$$\frac{\tan x \sec x}{\csc x + \sin x} = \frac{\frac{\sin x}{\cos x}\cdot\frac{1}{\cos x}}{\frac{1}{\sin x} + \sin x}$$

$$= \frac{\frac{(-)}{(+)}\cdot(+)}{(-)+(-)} = \frac{(-)}{(-)} = + \text{ EVEN}$$

$(-)(-) = +$

$(-)+(-) = -$

$(+)+(-) =$ Neither.

$(+)(-) = -$

$$f(x) = \frac{\tan x \sec x}{\csc x + \sin x}$$

$$f(-x) = \frac{\tan(-x)\sec(-x)}{\csc(-x)+\sin(-x)} = \frac{-\tan x \sec x}{-\csc(x)-\sin(x)} = \frac{-\tan x \sec x}{-(\csc x + \sin x)}$$

$$= \frac{\tan x \sec x}{\csc x + \sin x} = f(x)$$

means EVEN

Cofunction jazz

f & cof

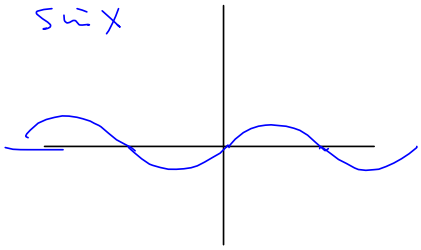
sine & cosine

secant & cosecant

tangent & cotangent

$f\left(\frac{\pi}{2}-x\right) = cof(x)$

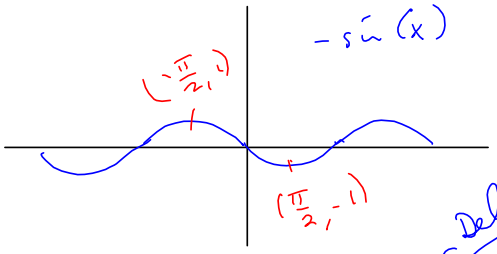
$\sin\left(\frac{\pi}{2}-x\right) = \cos(x)$



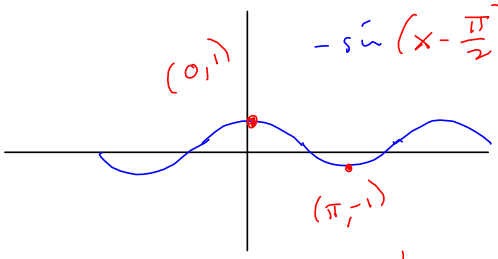
So, indeed, $\sin\left(\frac{\pi}{2}-x\right) = \cos(x)$

$\sin\left(\frac{\pi}{2}-x\right) = \sin\left(-\left(x-\frac{\pi}{2}\right)\right)$

$= -\sin\left(x-\frac{\pi}{2}\right)$



Delay by $\pi/2$ shift right $\pi/2$

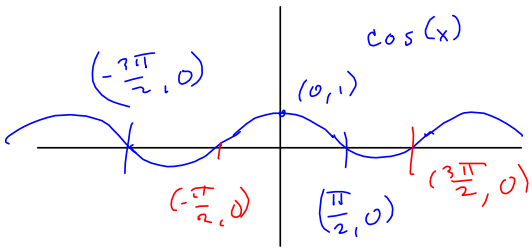


is cosine!

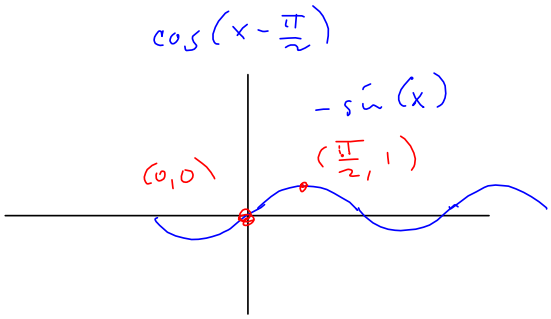
$\cos\left(\frac{\pi}{2}-x\right)$

$= \cos\left(-\left(x-\frac{\pi}{2}\right)\right)$ is even

$= \cos\left(x-\frac{\pi}{2}\right)$ Right $\frac{\pi}{2}$.



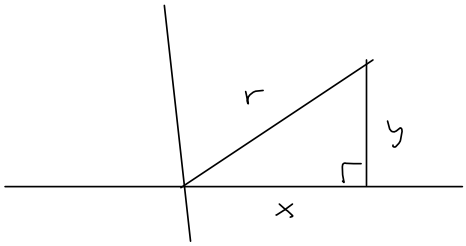
$\cos(-\text{Man}) = \cos(\text{Man})$



Pythagorus (BASIC)

what if r = 1?

we're on the unit circle



$x^2 + y^2 = r^2$

if $r = 1$, then

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

KNOW IT.

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

CHEAT SHEET MATERIAL

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

$x = r\cos\theta$

& if $r = 1$,

then $x = \cos\theta$

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

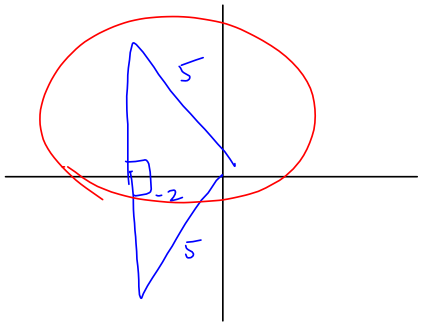
$= \frac{\sin^2\theta + \cos^2\theta}{\cos^2\theta} = \frac{1}{\cos^2\theta} = \sec^2\theta$

Reciprocal Identities,

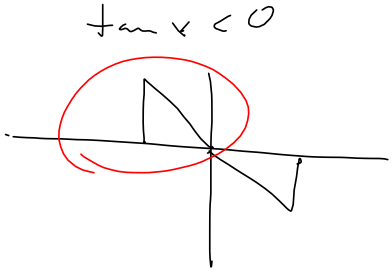
like $\csc\theta = \frac{1}{\sin\theta}$, I expect you to know.

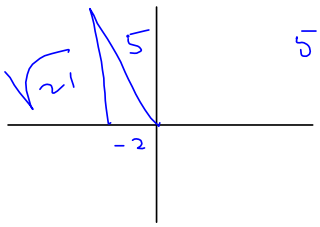
$\sec x = -\frac{5}{2}$ $\tan x < 0$

$\Rightarrow \cos x = -\frac{2}{5}$



$\tan x < 0$





$5^2 - (-2)^2 = 25 - 4 = 21$

$\rightsquigarrow \sqrt{21}$

$\sin\theta = \frac{\sqrt{21}}{5}$ $\quad \csc\theta = \frac{5}{\sqrt{21}}$

$\cos\theta = \frac{-2}{5}$ $\quad \sec\theta = -\frac{5}{2}$

$\tan\theta = -\frac{\sqrt{21}}{2}$ $\quad \cot\theta = -\frac{2}{\sqrt{21}}$

$\sin x = -\frac{6}{7}$

$\csc x = -\frac{7}{6}$, $\tan\theta > 0$ $\quad \tan\theta > 0$