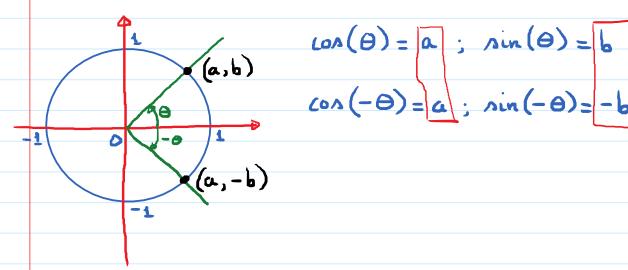
5.1 Fundamental Identities

Even odd Identifier



For any angle Θ , we have:

$$con(-\theta) = con(\theta)$$
; $sin(-\theta) = -sin(\theta)$

(Even/odd Identities)

$$\frac{\text{E.g. } \cos\left(-\frac{\pi}{4}\right) - \cos\left(\frac{\pi}{4}\right) - \frac{\sqrt{2}}{2}}{\sin\left(-\frac{5\pi}{6}\right) - \sin\left(\frac{5\pi}{6}\right) - \frac{1}{2}}$$

$$tan(-\theta) = \frac{nin(-\theta)}{con(-\theta)} = \frac{-nin(\theta)}{con(\theta)} = \frac{nin\theta}{con\theta}$$

$$tan\theta$$

$$tan(-\Theta) = -tan \Theta$$
.

$$\Delta e(-\theta) = \frac{1}{\omega \gamma(-\theta)} = \frac{1}{\omega \gamma(\theta)} = \Delta e(\theta)$$

To sum up, for any angle O

Even
$$\sin(-\theta) = -\sin\theta$$
; $\cos(-\theta) = \cos\theta$

$$O(-\theta) = -O(\theta)$$
; $O(-\theta) = O(\theta)$

Identities
$$csc(-\theta) = -csc\theta$$
; $sec(-\theta) = sec\theta$
 $tan(-\theta) = -tan\theta$; $cot(-\theta) = -cot\theta$

Change the name of the augle @ to x

$$\min(-x) = -\min x$$
; $\cos(-x) = \cos(x)$

$$CNC(-x) = -CNCNC$$
; $NRC(-x) = NRC(x)$

$$\sin(-x) = -\sin x ; \cos(-x) = \cos(x)$$

$$\csc(-x) = -\csc x ; \sec(-x) = \sec(x)$$

$$\tan(-x) = -\tan(x); \cot(-x) = -\cot(x)$$

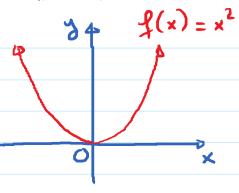
sine, co secont, tangent, cotangent are ODD functions

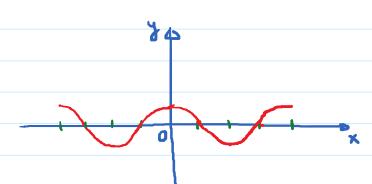
cosine, secant are EVEN functions

Recall (collège algebra):

$$[E,g]$$
 $f(x) = x^2$ is can even function.

$$f(-x) = (-x)^2 = x^2 - f(-x) = f(x)$$

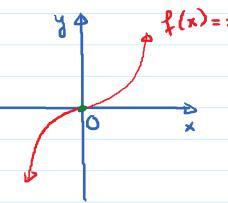


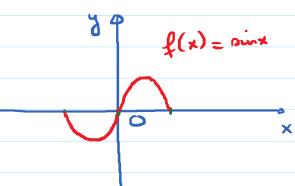


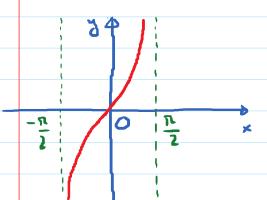
Graph of any even function is symmetric w.r.t y-axis

E.g.
$$f(x) = x^3$$
 in an odd function.

$$f(-x) = (-x)^3 = -x^3 = -f(x)$$







Graph of any odd function is

symmetric w.r.t. Origin

8:39 AM

Pythagonean Identities. For any angle x

$$Ain^{2}(x) + cos^{2}(x) = 1$$

$$(a,b) \quad Ain(x) = b ; cos(x) = a$$

$$-1 \quad 0 \quad a \quad 1$$

$$= 1$$

$$Ain^{2}(x) + cos^{2}(x) = b^{2} + a^{2}$$

$$= 1$$

$$cos^{2}(x) = 1 - cos^{2}(x)$$

$$cos^{2}(x) = 1 - sin^{2}(x)$$

$$cos^{2}(x) = -sin^{2}(x)$$

$$\frac{1}{1} \int \frac{dx}{(x)} dx = \Lambda e^{2}(x) - 1$$

$$\frac{1}{1} \int \frac{dx}{(x)} dx = \Lambda e^{2}(x) - 1$$

$$\frac{1}{1} \int \frac{dx}{(x)} dx = \Lambda e^{2}(x) - 1$$

$$cx^{2}(x) - \omega t^{2}(x) = 1$$

Keciprocal Identities.

$$Sec(x) = \frac{1}{con(x)}; cx(x) = \frac{1}{sin(x)}$$

$$tan(x) = \frac{1}{cot(x)}; cot(x) = \frac{1}{tan(x)}$$

Quotient Identities

$$tan(x) = \frac{sin(x)}{cos(x)}$$
, $cot(x) = \frac{cos(x)}{sin(x)}$

E.x. Is it true that for any angle x, we have:

$$\left[\operatorname{Sec}(x) - \tan(x)\right] \cdot \left[\operatorname{Sec}(x) + \tan(x)\right] = 1$$

Last Hand side =

$$Nec^{2}(x) + Nec(x)tan(x) - tan(x) \cdot Nec(x) - tan^{2}(x)$$

$$= Nec^{2}(x) - tan^{2}(x) = 1$$

E.x. In it true that

$$\left[\sin(x) + \cos(x)\right] = 1 + 2\sin(x) \cdot \cos(x)$$

for any angle x?

LHS =
$$\left[\sin(x) + \cos(x)\right] \cdot \left[\sin(x) + \cos(x)\right]$$

=
$$\sin^2(x) + \sin(x)\cos(x) + \cos(x)\sin(x) + \cos^2(x)$$

=
$$\sin^2(x) + \cos^2(x) + 2 \sin(x) \cos(x)$$

=
$$1 + 2 \sin(x) \cos(x) = RHS$$

Ex. Is it true that

$$\sin^4 x - \cos^4 x = \sin^2 x - \cos^2 x$$
 for any angle

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