

## Re: Sin Cos Tan, why not Sin Sec Tan?

**Source:** <http://sci.tech-archive.net/Archive/sci.math/2004-07/3892.html>

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**From:** Peter Webb ([webbfamily\\_at\\_DIESPAMDIEoptusnet.com.au](mailto:webbfamily_at_DIESPAMDIEoptusnet.com.au))

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Cassandra:

Some decisions in math are arbitrary. For example, you occasionally get people posting a statement that pi as 3.14159... shouldn't be the fundamental constant; it should be half of this (1.57...) or double this (6.283...), as these would make some expressions slightly simpler.

Maybe the 6 legged octopuses that live on planet Xoen use 1.57.. or 6.283.. as the fundamental constant, and on Xoen pi is defined as the ratio of a circle's circumference to its radius. I don't know.

However, I bet on Xoen they use sin and cos and not sec and csc:

1. You far more often see "sin" in a numerator than a denominator, so sin should be the basic ratio and not 1/sin.
2. This is partly because of a point somebody else made, that when you decompose a vector into its components, sin and cos appear naturally. This is a lot of the practical (and theoretical) use of trig.
3. Pythagoras theorem is  $\sin^2 + \cos^2 = 1$ . This is used all the time. Its a lot easier to spot and use than  $1/\sec^2 + 1/\csc^2 = 1$ .

You certainly could use csc and sec instead of sin and cos. But consider the use that you make of trig, and look at what the corresponding formulas would be if you used sec and csc. I bet 90%+ the formulas are simpler using sin and cos, and when you start doing calculus, this ratio increases to 95%+.

"Cassandra Thompson" <[cass.harley@bigpond.com](mailto:cass.harley@bigpond.com)> wrote in message news:eZoJc.1791\$K53.467@news-server.bigpond.net.au...

> |-/erc wrote:

>

>> "Cassandra Thompson" <[cass.harley@bigpond.com](mailto:cass.harley@bigpond.com)> wrote

>>

>>>  $\sin@ = O/H$

>>>  $\cos@ = A/H$

>>

>>

>> These 2 are grouped together because they divide by the longest

>> side on the triangle and are both  $\leq 1$ .

sci.math: Re: Sin Cos Tan, why not Sin Sec Tan?

- > >
- > > *But Tan is useful for the simplest of geometrical calculations*
- > > *so it became a 3some.*
- > >
- > >
- > >> *Tan@ = O/A*
- > >
- > >
- > > *Either Tan or Sin&Cos can be taught 1st, IMO.*
- > >
- > > *Herc*
- > >
- > >
- > >
- > *NB.*
- >
- > *I should add that you have cleared it up somewhat.*
- >
- > *You are in effect saying (regardless of my slight confusion as to why*
- > *sin/cos is better to teach first then sec/csc) that we are teaching the*
- > *students:*
- > *(sin/cos) and (tan)*
- >
- > *as opposed to*
- > *(sin, cos, tan)*
- >
- > *Is this correct?*