Units, functions, etc

$\mathrm{SiNum}(x) := xx \leftarrow \mathrm{Shi}(x)\ \mathrm{float}, 20 \ \rightarrow 4.97344047585980679 77$

$\mathrm{SiNum}(2.0) = 2.5016$

Numeric evaluation, but, given the precisoin, it's really a symbolic result

$$v := \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$$

$\mathrm{SiNum}(v) = \blacksquare$

Numeric evaluation, but, given the precisoin, it's really a symbolic result

$$\overrightarrow{\mathrm{SiNum}(v)} = \begin{pmatrix} 1.0573 \\ 2.5016 \\ 4.9734 \end{pmatrix}$$

Now it looks like a numeric result

$$1 \cdot \overrightarrow{\mathrm{SiNum}(v)} = \begin{pmatrix} 1.0573 \\ 2.5016 \\ 4.9734 \end{pmatrix}$$

But it's not.

$xx := 1.0 \cdot \overrightarrow{\mathrm{SiNum}(v)} \rightarrow 1.0 \cdot \mathrm{Shi}(x)$

Why use symbolic operator? Don't need it after initial definiton at top of sheet.

$1.0 \cdot xx = \blacksquare$

This extra step seems to fix it **??? I see red in v11.**

$yy := \overrightarrow{\mathrm{SiNum}(v)}$

$$yy = \begin{pmatrix} 1.0573 \\ 2.5016 \\ 4.9734 \end{pmatrix}$$

$\mathrm{SiNum2}(X) := 1.0 \cdot \overrightarrow{\mathrm{SiNum}(X)} \rightarrow 1.0 \cdot \mathrm{Shi}(X)$

But it doesn't work as a function

$\mathrm{SiNum2}(2) = \blacksquare$

What I'm really trying to calculate; a small differecne of two large terms. In this case, the first 45 (approx) significant digits of the two terms are the same, hence the need for extended precision in the calc.

$$\mathrm{Shi}(zz)\cdot\sinh(zz) - \cosh(zz)\cdot\mathrm{Chi}(zz) \left|\begin{array}{l}\text{substitute}, zz = 50\\ \text{float}, 80\end{array}\right. \rightarrow -4.0096781291455848412919213080722299\cdot 10^{-4}$$

expected

$$\mathrm{Shi}(zz)\cdot\sinh(zz) - \cosh(zz)\cdot\mathrm{Chi}(zz) \left|\begin{array}{l}\text{substitute}, zz = 50.\\ \text{float}, 80\end{array}\right. \rightarrow 0$$

unexpected

$$\mathrm{Shi}(zz)\cdot\sinh(zz) - \cosh(zz)\cdot\mathrm{Chi}(zz) \left|\begin{array}{l}\text{substitute}, zz = 50.1\\ \text{float}, 80\end{array}\right. \rightarrow 0$$

unexpected

Here's one of the terms to show its order of magnitude. Making the argument real by adding the decimal point seems to limit the internal precision, even though the argument doesn't have many significant digits. The terms differ stating in the fourth fractional decimal place.

$$\mathrm{Shi}(zz)\cdot\sinh(zz) \left|\begin{array}{l}\text{substitute}, zz = 50\\ \text{float}, 80\end{array}\right. \rightarrow 137208525360434953543267457853152763993507.36823252616376976927089274776304579919$$

good

$$\mathrm{Chi}(zz)\cdot\cosh(zz) \left|\begin{array}{l}\text{substitute}, zz = 50\\ \text{float}, 80\end{array}\right. \rightarrow 137208525360434953543267457853152763993507.36863349397668432775502193989385302218$$

$$\mathrm{Shi}(zz)\cdot\sinh(zz) \left|\begin{array}{l}\text{substitute}, zz = 50.\\ \text{float}, 80\end{array}\right. \rightarrow 1.3720852536043495354\cdot 10^{41}$$

why limited precision?

$$\mathrm{Shi}(zz)\cdot\sinh(zz) \left|\begin{array}{l}\text{substitute}, zz = 50.1\\ \text{float}, 80\end{array}\right. \rightarrow 1.6724525078073644506\cdot 10^{41}$$