Evaluating a Formula like in a Texbook

Evals

Sintaxis

`Evals(eq, values, n, u)`	Try to show eq at values with n decimals in the unit u as in a textbook.
`Evals(eq, values, n)`	For equations without units
`Evals(eq, values)`	Uses the decimals in the values, with a maximun of 6 (n=-1).
`Evals(v, eq, values, n, u)`	Assign to v the result of the equation.

- For specify units in values, use ~ as first character, instead '
- If the equation have constants with decimals, mask it with v2s
- The order of the values is the lexical order, given by Unknows(eq)

Example

$$E := Evals\left(\frac{a\cdot c + b\cdot\cos(c)}{c^2 + v2s(500.37)}, \left[194400\ \ 44640\ \ \frac{5\cdot\pi}{12}\right]\right)$$

Using maximun 6 decimals

$$E = \left[\frac{a\cdot c + b\cdot\cos(c)}{500.37 + c^2} = \frac{194400.\cdot 1.308997 + 44640.\cdot\cos(1.308997)}{500.37 + 1.308997^2} = \frac{266022.696343}{502.083473} = 529.837588\right]$$

Example

$$E := Evals\left(\frac{a\cdot c + b\cdot\cos(c)}{c^2 + v2s(500.37)}, \left[194400\ \ 44640\ \ \frac{5\cdot\pi}{12}\right], 3\right)$$

Using 3 decimals for all numbers in values.

$$E = \left[\frac{a\cdot c + b\cdot\cos(c)}{500.370 + c^2} = \frac{194400.000\cdot 1.309 + 44640.000\cdot\cos(1.309)}{500.370 + 1.309^2} = \frac{266023.150}{502.083} = 529.838\right]$$

Example

If the output is too long, it could be arranged into a table. Convertion facturs use 6 dedimals.

$$E := Evals\left(\frac{a\cdot c + b\cdot\cos(c)}{c^2 + v2s(500.37)}, \left[0.18\cdot\frac{in}{s^2}\ \ 12.4\cdot\frac{ft}{min^2}\ \ 75\cdot deg\right], 3, \frac{ft}{hr^2}\right)$$

$$\frac{a\cdot c + b\cdot\cos(c)}{500.370 + c^2}$$

$$= \frac{0.180\cdot in\cdot 75.000\cdot deg\cdot min^2 + 12.400\cdot ft\cdot\cos(75.000\cdot deg)\cdot s^2}{min^2\cdot s^2\cdot\left(500.370 + 75.000^2\cdot deg^2\right)}$$

$$= \frac{0.180\cdot 0.0254\cdot 75.000\cdot 0.017453\cdot 60.^2 + 12.400\cdot 0.3048\cdot\cos(75.000\cdot 0.017453)}{60.^2\cdot\left(500.370 + 75.000^2\cdot 0.017453^2\right)}\ \frac{12960000.}{0.3048}\ \frac{ft}{hr^2}$$

$$= 529.838\cdot\left[\frac{ft}{hr^2}\right]$$

Example

$$E := Evals\left(\frac{2\cdot m_1\cdot m_2}{m_1 + m_2}\cdot g_e, \left[9.8\cdot\frac{m}{s^2}\ \ 17.3\cdot lb\ \ 12.4\cdot lb\right], 2, lbf\right)$$

$$E = \left[\frac{2\cdot m_1\cdot m_2\cdot g_e}{m_1 + m_2} = \frac{2\cdot 17.30\cdot lb\cdot 12.40\cdot 9.80\cdot m}{(17.30 + 12.40)\cdot s^2} = \frac{2\cdot 17.30\cdot 0.453592\cdot 12.40\cdot 9.80}{17.30 + 12.40}\ \frac{1}{4.448222}\ lbf = 14.44\ lbf\right]$$

$$\frac{2\cdot m_1\cdot m_2\cdot g_e}{m_1 + m_2} = \frac{2\cdot 17.30\cdot lb\cdot 12.40\cdot 9.80\cdot m}{(17.30 + 12.40)\cdot s^2} = \frac{2\cdot 17.30\cdot 0.453592\cdot 12.40\cdot 9.80}{17.30 + 12.40}\ \frac{1}{4.448222}\ lbf = 14.44\ lbf$$

E

Example For the 5 args version, first argument is the variable name to be assigned the result.

$$v_2 := \frac{a \cdot c + b \cdot \cos(c)}{500.370 + c^2} = \frac{194400.000 \cdot 1.309 + 44640.000 \cdot \cos(1.309)}{500.370 + 1.309^2} = \frac{266023.150}{502.083} = 529.838$$

Symbolic

$$\text{Evals}\left(v_2, \frac{a \cdot c + b \cdot \cos(c)}{c^2 + v2s(500.37)}, \left[194400\ 44640\ \frac{5 \cdot \pi}{12}\right], 3, 1\right)$$

$v_2 = 529.838$

Numerical

$$T := \frac{2 \cdot m_1 \cdot m_2 \cdot g_e}{m_1 + m_2} = \frac{2 \cdot 17.30 \cdot \mathbf{lb} \cdot 12.40 \cdot 9.80 \cdot \mathbf{m}}{(17.30 + 12.40) \cdot \mathbf{s}^2} = \frac{2 \cdot 17.30 \cdot 0.453592 \cdot 12.40 \cdot 9.80}{17.30 + 12.40} \frac{1}{4.448222}\ \mathbf{lbf} = 14.44\ \mathbf{lbf}$$

$$\text{Evals}\left(T, \frac{2 \cdot m_1 \cdot m_2}{m_1 + m_2} \cdot g_e, \left[9.8 \cdot \frac{\mathbf{m}}{\mathbf{s}^2}\ 17.3 \cdot \mathbf{lb}\ 12.4 \cdot \mathbf{lb}\right], 2, \mathbf{lbf}\right)$$

$T = 14.44\ \text{lbf}$

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