CSL expected output for 163-redLatex.R

1 redLtxTyp-gen-001

from Rudin, Principles of Mathematical Analysis, page 44, equation 11:

$$dj_{\gamma yz} = \gamma^2 - 2\gamma y + y^2$$
$$dk^z_{xy} = \sqrt{|x-y|}$$
$$dl_{\gamma y} = |\gamma^2 - y^2|$$
$$dm_{xy} = \frac{|\varepsilon - \varkappa|}{1 + |\varepsilon - \varkappa|}$$

REDUCE produces:

$$dj_{\gamma yz} = \gamma^2 - 2\gamma y + y^2 \tag{1}$$
$$dk^z_{xy} = \sqrt{|x-y|} \tag{2}$$
$$dl_{\gamma y} = |\gamma^2 - y^2| \tag{3}$$
$$dm_{xy} = \frac{|\varepsilon - \varkappa|}{|\varepsilon - \varkappa| + 1} \tag{4}$$

2 redLtxTyp-gen-002

from Rudin, Principles of Mathematical Analysis, page 113, equation 37. In Rudin eqn is

$$\frac{dg}{dx} = 1 + \{2x - \frac{2i}{x}\}e^{i/x^2}$$

closest I can get is using *on div; off mcd* is

$$\frac{dg}{dx} = -2e^{ix^{-2}}ix^{-1} + 2x + 1 \tag{5}$$

3 redLtxTyp-gen-003

from Reuter, Ordinary Differential Equations, page 23, equation 6:

$$\frac{dy}{dx} + \alpha y + \beta z = 0$$
$$\frac{dz}{dx} + \delta z + \gamma y = 0$$

REDUCE produces

$$\frac{dy}{dx} + \alpha y + \beta z = 0 \tag{6}$$
$$\frac{dz}{dx} + \delta z + \gamma y = 0 \tag{7}$$

4 redLtxTyp-gen-004

from Schroedinger, Statistical Thermodynamics, page 20, Planck Oscillator. Original

$$U = \frac{h\nu}{2} + \frac{h\nu}{e^{\frac{h\nu}{kT}} - 1}$$

but nearest I can get is using *on div; off mcd;* and *korder h, nu, k, !T* resulting in

$$U = h\nu\left(e^{h\nu k^{-1}T^{-1}} - 1\right)^{-1} + \frac{1}{2}h\nu \tag{8}$$

5 redLtxTyp-gen-005

from Schroedinger, Statistical Thermodynamics, page 45, equations 7.9, 7.10, 7.11. Original is

$$\begin{aligned}\zeta^{-n-1} f(\zeta) &= e^{g(\zeta)} \\ g'(\zeta) &= -\frac{n+1}{\zeta} + \frac{f'(\zeta)}{f(\zeta)} \\ g''(\zeta) &= \frac{n+1}{\zeta^2} + \frac{f''(\zeta)}{f(\zeta)} - \frac{f'(\zeta)^2}{f(\zeta)^2}\end{aligned}$$

but nearest I can get is using *on div, combineexpt* and *off exp* (mcd seems to have no effect) resulting in

$$\frac{f(\zeta)}{\zeta^{n+1}} = e^{g(\zeta)} \tag{9}$$

$$g'(\zeta) = \frac{-(n+1) f(\zeta) + f'(\zeta) \zeta}{f(\zeta) \zeta} \tag{10}$$

$$g''(\zeta) = \frac{\left(f(\zeta) f''(\zeta) - f'(\zeta)^2\right) \zeta^2 + (n+1) f(\zeta)^2}{f(\zeta)^2 \zeta^2} \tag{11}$$

6 redLtxTyp-gen-006

from Albert Einstein, The Meaning of Relativity, page 81. To get the eqn in the original form:

$$R_{\mu\nu} - \frac{g_{\mu\nu} R}{2} = -\varkappa T_{\mu\nu}$$

it's necessary to use *korder* to put *kappa* before T and set *div* on and *mcd* off.

$$R_{\mu\nu} - \frac{1}{2} g_{\mu\nu} R = -\varkappa T_{\mu\nu} \tag{12}$$

7 redLtxTyp-gen007

Tests for the usermap *arb* with *index* and *ident* to map * to thinspace

$$\frac{d\,g}{d\,x} = -2\, e^{i\, x^{-2}} \left(i - x^2\right) x^{-1} + 1 \tag{13}$$

$$R_{\mu\nu} - \frac{1}{2}\, g_{\mu\nu}\, R = -\varkappa\, T_{\mu\nu} \tag{14}$$

$$(\beta - \gamma)\left(m^2 + n^{-2}\right) \tag{15}$$

8 redLtxTyp-gen008

Tests for the usermap *arb* element alone, with ident, index and arb

$$K^{+0}_{\ 0} = \frac{2}{u^3} \tag{16}$$

$$K^{+1}_{\ 1} = 2x\,(3)^2\, u \tag{17}$$

$$K^{+2}_{\ 2} = 2\sin\left(x\,(1)\right)^2 x\,(3)^2\, u \tag{18}$$

9 redLtxTyp-gen009

Tests for the usermap with only ident and index

$$K^{+0}_{\ 0} = \frac{2}{u^3} \tag{19}$$

$$K^{+1}_{\ 1} = 2x\left(3\right)^2 u \tag{20}$$

$$K^{+2}_{\ 2} = 2\sin\left(x\left(1\right)\right)^2 x\left(3\right)^2 u \tag{21}$$