

Mixing Weyl and Gauss

February 10, 2017 9:16 AM

$$\begin{aligned} \mathcal{O}(e^{cf} / fe) &= \mathcal{O}(e^{f\partial_\alpha \partial_\beta} e^{fe} e^{-cf} |_{\alpha=\beta=0} / fe) = e^{f\partial_\alpha \partial_\beta} \mathcal{O}(e^{fe} e^{-cf} / fe) |_{\alpha=\beta=0} \\ &= e^{f\partial_\alpha \partial_\beta} \mathcal{O}(e^{-\alpha\beta h + \beta c + \alpha f} / cf) |_{\alpha=\beta=0} = \mathcal{O}(e^{f\partial_\alpha \partial_\beta} e^{-\alpha\beta h + \beta c + \alpha f} |_{\alpha=\beta=0} / cf) \\ &= \mathcal{O} \end{aligned}$$

The g1 version, from 2017-02/g1.nb:

```
In[34]:= $TD = 8;
Simp[O[e^{h(\alpha f_1 + \beta e_1)}, {f_1, e_1} \to 1] -
O[(1 - \frac{1}{2} \alpha \beta e h^2 (-2 \beta h e_1 - 2 \alpha h f_1 + \alpha \beta h^2 h_1 - 4 1_1))
e^{h(-h h_1 \alpha \beta + \alpha f_1 + \beta e_1)}, {e_1, 1_1, f_1} \to 1]]
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Out[34]= 0

Aside. Compute $e^{f\partial_\alpha \partial_\beta} e^{-h\alpha\beta} |_{\alpha,\beta=0}$

$$\begin{aligned} \partial_\alpha \partial_\beta e^{-h\alpha\beta} &= \partial_\alpha (-h\alpha e^{-h\alpha\beta}) = (-h + h^2 \alpha \beta) e^{-h\alpha\beta} \\ &= (-h - h^2 \partial_h) e^{-h\alpha\beta} \end{aligned}$$

The corresponding logos:

$$\begin{aligned} &\frac{1}{2\mu^4} (-h\alpha^2 \beta^2 + e^2 \beta^2 \delta (2 + h\delta) + \\ &f^2 \delta (\alpha + e\delta) (\alpha (2 + h\delta) + e\delta (4 + 3h\delta)) - \\ &4h\alpha\beta\delta\mu + 4l\alpha\beta\mu^2 - 2h\delta^2\mu^2 + \\ &4l\delta\mu^3 + 2e\beta (\alpha\beta + 2\delta\mu (1 + l\mu)) + \\ &2f (\alpha^2\beta + 2\alpha\delta (e\beta (2 + h\delta) + \mu (1 + l\mu)) + \\ &e\delta^2 (e\beta (3 + 2h\delta) + 2\mu (2 + h\delta + l\mu))) \end{aligned}$$

The core logos:

$$\begin{aligned} &\frac{1}{2\mu^4} \delta (e^2 f^2 \delta^2 (4 + 3h\delta) + \\ &4ef\delta\mu (2 + h\delta + l\mu) + 2\mu^2 (-h\delta + 2l\mu)) \end{aligned}$$