

Name & Matrikelnummer:

Exercise 12, May 24, 2017

1. 2D spinor gymnastics (2+4+4 points)

(a) Spinor bilinear

Express

$$\bar{\psi}\rho^\alpha\partial_\alpha\psi \tag{1}$$

in components.

(b) Spin flip

Show that

$$\bar{\lambda}_1\rho^{\alpha_1}\dots\rho^{\alpha_n}\lambda_2 = (-1)^n\bar{\lambda}_2\rho^{\alpha_n}\dots\rho^{\alpha_1}\lambda_1 \tag{2}$$

(c) Fierz rearrangement

Show that

$$(\bar{\psi}\lambda)(\bar{\phi}\chi) = -\frac{1}{2} [(\bar{\psi}\chi)(\bar{\phi}\lambda) + (\bar{\psi}\bar{\rho}\chi)(\bar{\phi}\bar{\rho}\lambda) + (\bar{\psi}\rho^\alpha\chi)(\bar{\phi}\rho_\alpha\lambda)] \tag{3}$$