Name & Matrikelnummer:

Exercise 13, May 31, 2017

1. **SUSY invariance** (10 points)
   Show that
   $$S = -\frac{1}{8\pi}\int d^2\sigma \left(\frac{2}{\alpha'}\partial_\alpha X^\mu \partial^\alpha X_\mu + 2i\bar{\psi}^\mu \rho^\alpha \partial_\alpha \psi_\mu\right) \tag{1}$$
   is invariant under
   $$\sqrt{\frac{2}{\alpha'}}\delta_\epsilon X^\mu = i\bar{\epsilon}\psi^\mu \tag{2}$$
   $$\delta_\epsilon \psi^\mu = \frac{1}{2}\sqrt{\frac{2}{\alpha'}}\rho^\alpha \partial_\alpha X^\mu \epsilon, \tag{3}$$
   for (non-constant) ϵ satisfying $\rho^\beta \rho_\alpha \partial_\beta \epsilon = 0$.