Introduction to String Theory exercises - sheet 1

Equation numbers refer to Blumenhagen / Lüst / Theisen

Exercise 1

Derive equations 2.81a-c from equation 2.64 (the Poisson brackets in conformal gauge). If you get stuck, show that equations 2.81a-c at least are consistent with equations 2.64, which is a consistency check.

Exercise 2

Using the Poisson bracket identity

$$\{fg, h\} = f\{g, h\} + \{f, h\}g$$

prove equation 2.88 from equation 2.83

Exercise 3

Show target space momentum conservation in a particular direction enforces Neumann boundary conditions in the open string. (Hint: work in conformal gauge, and derive the conservation equation from translation invariance. You'll need the equation of motion.)