Mathematical Physics — PHZ 3113
Homework 9 (March 25, 2013)
Jacobi Determinant

1. Calculate

$$I \;=\; \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} dx\, dy\, e^{-(x-y)^2-(x+y)^2} \,.$$

2. Calculate

$$I = \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} dx_1\, dx_2\, dx_3$$

$$e^{-(x_1+x_2+x_3)^2-(x_1+x_2-x_3)^2-(x_1-x_2-x_3)^2} \,.$$