

# Introduction to mathematical cryptography

## Homework problems

### Week 11

21. Prove that the entropy function has the properties (H1), (H2) and (H3).
22. Prove that

$$\lim_{p \rightarrow 0^+} p \log_2 p = 0.$$

(This statement means that we can add values of zero probability to our random variable: the entropy does not change if we define the terms  $0 \log_2 0$  to be the above limit, namely, 0.)

**Note:** Please provide complete arguments everywhere.