

1. Exercise 4.6a: Show that  $\mathbf{R}^{\text{pub}}(f^\ell) = O(\ell \cdot \log \ell \cdot \mathbf{R}^{\text{pub}}(f))$ , for all  $f$ .

2. Exercise 4.8: Lemma 4.7 only states the property that we need for our purposes. In this exercise we take a more complete view on the measure  $B^1$ :

(a) Express  $B^1$  as a linear program. Use the duality theorem of linear programming to write its dual program. Use the dual program to solve the next two parts of this exercise.

(b) Prove that  $B^1(f \wedge g) = B^1(f) \cdot B^1(g)$ .

(c) Prove that

$$\log B^1(f) \leq \mathbf{R}^{1,\text{pub}}(f) + O(1)$$

(recall that  $\mathbf{R}^{1,\text{pub}}(f)$  is the complexity of computing  $f$  using a public coin protocol that makes a one-sided error).