1. In class we proved that $D(\mathsf{EQ}) \geq n$ and $D(\mathsf{IP}_2) \geq n$, where n is the length of the input of Alice and Bob. Show that $D(\mathsf{EQ}) = n + 1$ (the fooling set argument) and $D(\mathsf{IP}_2) = n + 1$ (the rank lower bound).

2. Exercise 1.26 of the CC Book: Prove that the size of any 1-monochromatic rectangle of the DISJ function is at most 2^n. Conclude that $D(\mathsf{DISJ}) = \Omega(n)$.

3. Exercise 1.31 of the CC Book: Let $f : X \times Y \to \{0, 1\}$ be a Boolean function:

a). Prove that if f is such that all the rows of M_f are distinct, then $D(f) \geq \log\log |X|$.

b). Prove that $D(f) \leq \mathsf{rank}(f) + 1$.