CS 1511 Homework 22

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43.

If a = 0^n, Simon's algorithm still works. This is because if the function is one-to-one, and $a = 0^n$, after we compute $\mid xz\rangle - >\mid x(y \oplus f(x))\rangle$ we can measure $\mid (x \oplus a)$ and see that it's equivalent to x. This will let us know that $a = 0^n$. We will therefore have correctly computed a. Or, if we continue Simon's algorithm, we will eventually be finding k linear equations for $y \odot a = 0$ with a uniform string for y that makes this true. In this case, every single one of these y's will work. Solving the linear equations will give us that all values of a are 0, which is true.

44 a.

44 b.

44 c.