Exercise sheet 6

1. For each language that you proved was regular in the previous exercise sets, find a context free grammar to generate it. Is every regular language a context free language?
2. Find a context-free grammar to generate the following languages over $\Sigma := \{0, 1\}$:
   a) $\{0^n 1^n \mid n = 0, 1, \ldots\}$
   b) The complement of the previous language
   c) $\{0^m 1^n \mid m > n, m, n = 0, 1, \ldots\}$
3. What language does the context free grammar $G := (\{X\}, \{(,)\}, R, X)$, where $R = \{X \to (X) \mid XX \mid \epsilon\}$ generate?
4. Find a context free grammar that generates the language consisting of precisely those strings that are polynomials in x with integer coefficients.