Homework II

1. [15 points]
Write ordinary (i.e., pure) BNF that is equivalent to the Extended BNF below; {…} denotes arbitrarily many, and […] denotes optional. Justify your solution.

<float> → <digit> {<digit>} **.** {<digit>} [E [+ | -] <digit> {<digit>}]
<digit> → 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

2. [30 points]

Using the EBNF for Java (see class Web page), provide a derivation tree for each of the following, or identify the reason it is invalid. The derivation steps from <identifier> to a sequence of lower-case letters and digits that begins with a letter should be omitted.

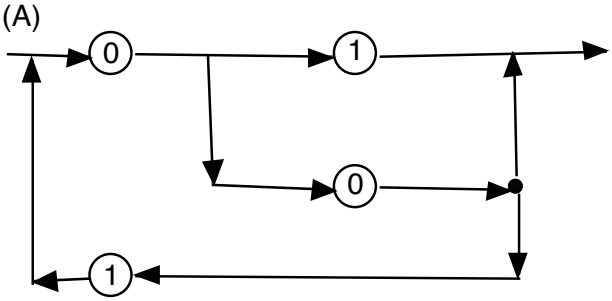
(a) from <decimal numeral> derive: 2

(b) from <array access> derive: a[b=2]

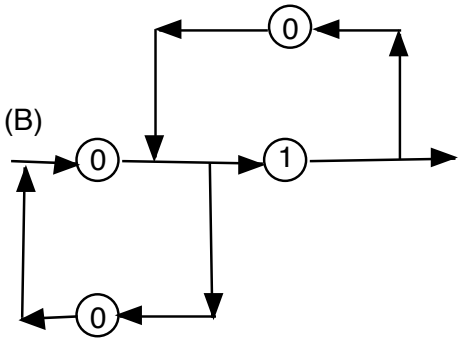
(c) from <statement> derive: **if** (x) **if** (y) { } **else break;**

3. [30 points]
For each of the syntax diagrams below, provide an Extended BNF definition that describes *exactly* the same language (C= {0,1}) and informally justify your answers.

(A)



(B)



(C)