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1. Using BNF write the syntax definitions of the following objects:

a) Natural number (1, 2, 3, ...). The answer:

⟨*natural number*⟩ ::= ⟨*non-zero digit*⟩ | ⟨*natural number*⟩ ⟨*digit*⟩

⟨*digit*⟩ ::= 0 | ⟨*non-zero digit*⟩

⟨*non-zero digit*⟩ ::= 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

b) Unsigned integer (0, 1, 2, 3, ...). The answer:

⟨*unsigned integer*⟩ ::= 0 | ⟨*non-zero digit*⟩ ⟨*digits*⟩

⟨*digits*⟩ ::= ⟨*digit*⟩ | ⟨*digits*⟩ ⟨*digit*⟩

⟨*digit*⟩ ::= 0 | ⟨*non-zero digit*⟩

⟨*non-zero digit*⟩ ::= 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

c) Integer (..., -2, -1, 0, 1, 2, ...). The answer:

⟨*integer*⟩ ::= ⟨*sign*⟩ ⟨*unsigned integer*⟩

⟨*sign*⟩ ::= + | - | ⟨*empty*⟩

⟨*empty*⟩ ::=

⟨*unsigned integer*⟩ ::= 0 | ⟨*non-zero digit*⟩ ⟨*digit*⟩

⟨*digits*⟩ ::= ⟨*digit*⟩ | ⟨*digits*⟩ ⟨*digit*⟩

⟨*digit*⟩ ::= 0 | ⟨*non-zero digit*⟩

⟨*non-zero digit*⟩ ::= 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

d) Odd number (..., -3, -1, 1, 3, ...). The answer:

⟨*add number*⟩ ::= ⟨*sign*⟩ ⟨*unsigned odd num*⟩

⟨*sign*⟩ ::= + | - | ⟨*empty*⟩

⟨*empty*⟩ ::=

⟨*unsigned odd num*⟩ ::= ⟨*odd digit*⟩ | ⟨*number*⟩ ⟨*unsigned odd num*⟩

⟨*number*⟩ ::= ⟨*non-zero digit*⟩ | ⟨*number*⟩ ⟨*digit*⟩

⟨*digit*⟩ ::= 0 | ⟨*non-zero digit*⟩

⟨*non-zero digit*⟩ ::= 2 | 4 | 6 | 8 | ⟨*odd digit*⟩

⟨*odd digit*⟩ ::= 1 | 3 | 5 | 7 | 9