1. Consider the following formal language:

- The alphabet contains the symbols $+$ $-$ $>$ $<$ $[ $ $]$
- The admissible words are any sequences of symbols $+$ $-$ $<$ $>$
- Grammatically correct sentences are sequences of bracketed admissible words. For example “[->>>++++<<<<][->+]” is a grammatically correct sentence while “[+++ [-->]]” is not.

Decide if the following are admissible words, grammatically correct sentences or neither.

(a) “->>>><<<<<+++”

(b) “[++[“

(c) “[>>>]”

2. Are the following predicates equivalent? Briefly explain your answer:

$P \land \neg Q \land \neg R \land \neg S \land \neg U$  $\neg P \lor Q \lor R \lor S \lor U$
Consider the predicates

\( P(x) : \) x is an even positive integer greater than 1

\( Q(x) : \) x is an even positive integer less than 10

(a) Is the set \( A = \{ x \mid P(x) \} \) finite? Explain.

(b) Let \( B = \{ x \mid Q(x) \} \). Is it true that \( B \subseteq A \)? Explain.

(c) Write the elements of the set \( A \cap B^c \).