QUIZ 5 SOLUTIONS - CSCI 341

Monday, October 1

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

(a) Write an inductive definition for $S = \{2, 4, 10, 28, 82, 244, \dots\}$.

Basis: $2 \in S$;

Induction: If $x \in S$, then $3x - 2 \in S$.

(b) Consider $S = \{n \in \mathbb{N} : n \bmod 5 = 3\}$.

- Then $S = \{3, 8, 13, 18, 23, 28, 33, \dots\}$.

- An inductive definition of S is as follows:

Basis: $3 \in S$;

Induction: If $x \in S$, then $x + 5 \in S$.

(c) Write an inductive definition of $S = \{a^m b^n : m, n \in \mathbb{N}, m, n > 0\}$.

Basis: $ab \in S$;

Induction: If $x \in S$, then $ax \in S$ and $xb \in S$.