1. (0 points) What is your name? Write it clearly. Staple your HW. When is the midterm? Where is the midterm? When is the Final?

2. (100 points) Consider the sentence

\[(\exists A)(\forall x)[x \in A \lor x + 1 \notin A].\]

(a) Draw a DFA for the Truth sets below.
   i. \(\{(x, A) \mid x \in A\}\)
   ii. \(\{(x, A) \mid x + 1 \in A\}\)
   iii. \(\{(x, A) \mid x + 1 \notin A\}\)

(b) Draw a DFA for the Truth set below.

\(\{(x, A) \mid [x \in A \lor x + 1 \notin A]\}\)

(c) Draw a DFA for the Truth set below.

\(\{A \mid (\forall x)[x \in A \lor x + 1 \notin A]\}\)

(d) Take the DFA you obtained in the last question. Test if it accepts anything.

(e) Using everything you’ve done determine if the following sentence is true.

\[(\exists A)(\forall x)[x \in A \lor x + 1 \notin A].\]