In-Class Worksheet
Discrete Math & Functional Programming— CSCI 054— Spring 2024
Instructor: Osborn
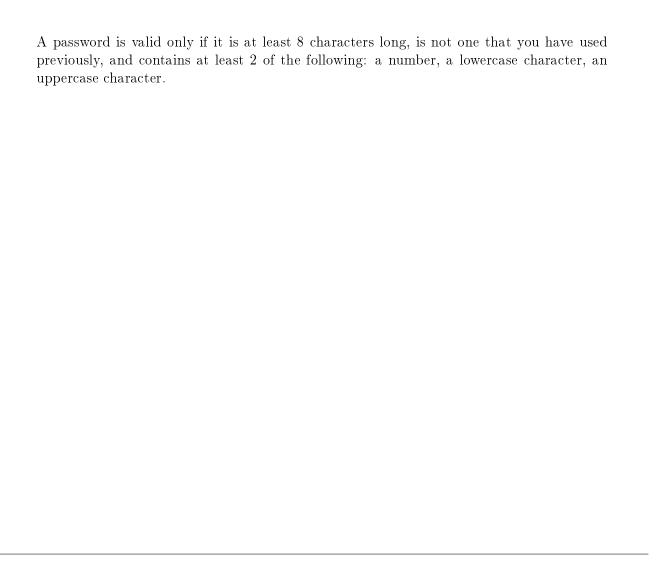
For each expression below, write an equivalent one that is simpler.

```
a && not a

a || (not a && b)

(not a || b) && (not b || c) &&
  (not c || not a) && (not c || not b)
```

$1 + 1 = 2$ implies that $2 + 3 = 5$

$1 + 1 = 2$ implies that $2 + 3 = 6$

$1 + 1 = 3$ implies that $2 + 3 = 5$

$1 + 1 = 3$ implies that $2 + 3 = 6$

A password is valid only if it is at least 8 characters long, is not one that you have used previously, and contains at least 2 of the following: a number, a lowercase character, an uppercase character.

Is the following statement a tautology? a contradiction? satisfiable? falsifiable?

$$p \vee q \Rightarrow \neg p \wedge \neg q$$