Math 8 HW #6

2.10

1) The number x is not positive, but the number y is positive
2) If x is not prime, then $\sqrt{x}$ is a rational number
3) There exists some prime number p such that ~~for every~~ prime number q where $q \leq p$.
4) There exists some positive number ε, such that there is a positive number δ such that $|x-a| \geq \delta$ implies $|f(x)-f(a)| \geq \varepsilon$.
5) There exists some positive ε, where for all positive number M, there is a number x where $|f(x)-b| \geq \varepsilon$ whenever $x > M$
6) For every real number a for which $a+x=x$ for some real number x.
7) I'll eat some things that have a face.
8) There exists some x that is a rational number and $\neq 0$ such that $\tan(x)$ is a rational number
9) There exists some number x such that $\sin(x) < 0$ and $0 \leq x \leq \pi$
10) There exists some polynomial f, with a degree ≤ 2 such that f' is constant
11) Theres some people / person that you can't fool all the time.
12) Sometimes when I have to choose between two evils, I choose the one I have tried

4.1

1) $\sim((\sim P) \wedge (\sim Q))$, $\sim Q$ are true.
   - If we know $\sim((\sim P) \wedge (\sim Q))$ are true, then $((\sim P) \wedge (\sim Q))$ must be false. Because we know $\sim Q$ is true, then for $((\sim P) \wedge (\sim Q))$ to be false, then $(\sim P)$ must be false, meaning P is true. ☒
2) $\sim R$, $P \Rightarrow R$, $P \vee Q$ are true.
   - Since we know $\sim R$ is true, then R is false. For $P \Rightarrow R$ to be true (which can be rewritten as $(\sim P) \vee R$) then $\sim P$ must be true, thus P is false. If P is false and $P \vee Q$ is true, then Q must be true. ☒