2.7

1) $\forall x \in R, x^2 > 0$

for every x in Real numbers $x^2 > 0$, false $0 > 0$

3) $\exists a \in R, \forall x \in R, ax = x$

there exist a in Real numbers that for every x in real numbers, $ax = x$. True $a = 1$

5) $\forall n \in N, \exists X \in P(N), |X| < n$

for every n is an element of Natural #'s
there exist set X in Power set of Natural #'s
, where the cardinality of the set X is less than n
True empty set $|X| = 0 < n$

7) $\forall X \subseteq N, \exists n \in Z, |X| = n$

for every subset X of Natural #s there exist n ; is an element of integers where cardinality of the set $X = n$ False

9) $\forall n \in Z, \exists m \in Z, m = n + 5$

for every interer n there exist an integer m where $m = n + 5$ True

2.9

1) $(P \wedge Q) \Rightarrow R$

P = f is a polynomial Q = f has a degree greater than 2

R = f' is not constant

3) $P \Rightarrow Q$

P = x is prime $Q = \sqrt{x}$ is not a rational #

5) $\forall E \in \mathbb{R}, E>0, \exists \delta \in \mathbb{R}, \delta>0, |f(x)-b| < \varepsilon \rightarrow |f(x)-f(a)| < \varepsilon$

7) $\exists a \in \mathbb{R}, \forall x \in \mathbb{R}, x+x=x$

9) $(P \wedge Q) \Rightarrow R$

P = x is rational # $Q = x \neq 0$ $R = \tan(x)$ is not in $\mathbb{Q}$

11) $\exists x, \forall y \in X, P(x) \wedge R(x,y)$

X = {idiots, drunkards, children, united states}

$P(x)$ = providence x

$R(x,y)$ = x protects y

13) $\forall x, (P(x) \wedge Q(x)) \Rightarrow R(x)$

$P(x)$ = x is not happening to me $Q(x)$ = x is happening to someone else

$R(x)$ = x is funny

2.10

1) The # x is not positive or the # y is positive

3) There exists a prime # p for every prime number q for which $q \leq p$

5) There exist a positive # ε for every positive # M for which $x > M$ whenever $|f(x) - b| \geq \varepsilon$

7) I will eat somethings that have a face

9) if $\sin(x) < 0$, then it is not the case that $0 \leq x \leq \pi$
$\exists x, (\sin(x) < 0) \wedge (0 \leq x \leq \pi)$
There exist a number x where $\sin(x) < 0$ and $0 \leq x \leq \pi$

11) There is a person you can't fool all of the time