- $coNP = \{L : \overline{L} \in NP\}$.

  $L \in NP$: every yes instance of L has a polynomial length proof of $x \in L$.

  $L \in coNP$: every no instance of L has a polynomial length refutation of $x \in L$.

- For example, $\overline{SAT}$, $\overline{HAMPATH}$, and $TAUTOLOGY$ are in class $coNP$.

- $P \subseteq NP \cap coNP$.

- FACTORING $= \{< n, a, b > | n, a, b$ are positive integers in binary and there exists a prime number $p \in [a, b]$ that divides $n\} \in NP \cap coNP$.

- PRIMES $= \{n \mid$ positive integer n is a prime number$\} \in NP \cap coNP$, and PRIMES was proven to be in class P.

- If $P = NP$ then $NP = coNP$.

- $coNP \subseteq PSPACE$.

- $L \in$ NP-hard $\Rightarrow \overline{L} \in$ coNP-hard.

- TAUTOLOGY $= \{\phi : \phi$ is a boolean formula that is satisfied by every truth assignment$\}$ is coNP-complete.

- If an NP-complete language is in coNP, then $NP = coNP$.