Summary of Chapter 17

The time complexity of a TM is the time taken as a function of the input length n in the worst case.

The class $\mathcal{P}$ is the set of all languages that are decidable by a TM running in polynomial time.

Examples of languages in $\mathcal{P}$ include `TRUEBF`, `PATH`, `PRIME` and any context-free language.

The class $\mathcal{NP}$ is the set of all languages that are decidable by a nondeterministic TM running in polynomial time.

Such a machine is equivalent to a deterministic machine which is handed a certificate to verify the answer.

Summary of Chapter 19

The $\mathcal{NP}$-complete languages are the hardest languages in $\mathcal{NP}$, and every language in $\mathcal{NP}$ polynomially reduces to these.

Examples of $\mathcal{NP}$-complete languages include `SAT` and `HAMPATH`.

A new problem can be proven $\mathcal{NP}$-complete by reduction from a problem already known to be $\mathcal{NP}$-complete.

It is known that $\mathcal{P} \subseteq \mathcal{NP}$ and it is believed that there is not equality.