$\mathcal{P}$ and $\mathcal{NP}$

- Note that $\mathcal{P} \subseteq \mathcal{NP}$.
- Hence $\mathcal{NP}$ contains easy problems and perhaps not so easy problems.
- Does $\mathcal{NP}$ contain problems that *cannot* be solved in polynomial time? If so then $\mathcal{P} \neq \mathcal{NP}$. Otherwise, $\mathcal{P} = \mathcal{NP}$.