Karp Reductions

Suppose $\pi' \in \mathcal{P}$, and that $\mathcal{A}$ is a polynomial time algorithm to solve π'.
Suppose $\pi \propto \pi'$, and that F is the Karp Reduction.

Given instance I to π,

- Compute $F(I)$, which is an instance of π'.
- Run algorithm $\mathcal{A}$ on $F(I)$
- If $\mathcal{A}$ says YES, then return YES; otherwise return NO.

So: if you can find a Karp Reduction from π to π', then if π' can be solved in polynomial time then so can π!