A Rippling Proof of $P = NP$

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$$P \quad = \quad NP$$

We proceed by induction on the polynomial P
Base case trivial (by symbolic evaluation)
Step case:

$$ax\,P^{\uparrow} \quad = \quad N\,ax\,P^{\uparrow}$$

Rippling in the step case is blocked. Proceed by case split on N
Zero branch

$$ax\,P^{\uparrow} \quad = \quad 0(\,ax\,P^{\uparrow}\,)$$

Weak fertilise

$$ax(NP) \quad = \quad 0\,(ax\,P)^{\uparrow}$$

Speculate lemma associativity of times - which instantiates N to 0
Now treat sucessor branch

$$\begin{aligned} ax\,P^{\uparrow} \quad &= \quad (Suc0)ax\,P^{\uparrow} \\ ax\,P^{\uparrow} \quad &= \quad ax\,P^{\uparrow} \\ P \quad &= \quad P \end{aligned}$$

which follows by reflexivity of equality □