Assignment 3: More induction, Sets and Relations

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1 Problem 1

Prove that $\forall n \in \mathbb{N} \wedge n \geq 1 \exists x \in \mathbb{N}. x * 17 = 3 * (5^{2n+1}) + (2^{3*n+1})$:
Base Case n=1:

- $3 * (5^{2*1+1}) + (2^{3*1+1}) = 17 * x$
- $391 = 17 * x$
- $23 = x$

Step Case n+1:

- $3 * (5^{2*(n+1)+1} + 2^{3*(n+1)+1}$
- $3 * 5 * 5 * 5^{2n+1} + 2 * 2 * 2^{3*n+1}$