

$$\forall x (\exists y Q(x, y)) \Rightarrow \exists y (\forall x Q(x, y)) \quad Q(x, y) : x > y$$

If true
then true

$$x \quad y \quad Q(x, y) \xrightarrow{\text{true/false}} x > y$$

$$x \in \mathbb{N} \quad y \in \mathbb{N} \quad y = -\infty$$

$$p_1, p_2, p_3$$

2, 3, 5

$$q = p_1 p_2 p_3 + 1 = 30 + 1 = \underline{31} \leftarrow \text{not prime}$$

$$p_1 p_2 p_3$$

$$p \mid 31$$

$$p \mid (31 - 1)$$

$$1, \underline{x}, \underline{n/x}, n$$

$$x \in f^{-1}(A \cap B) = \{x \mid f(x) \in A \cap B\}$$

$$\subseteq f^{-1}(A) \cap f^{-1}(B) = \{x \mid f(x) \in A\} \cap \{x \mid f(x) \in B\}$$

$$f^{-1}(A \cap B) = f^{-1}(A) \cap f^{-1}(B)$$

$$\forall x \in X, x \in Y$$

$$f(x) = x^2$$



$$X = Y$$

$$X \subseteq Y$$

$$Y \subseteq X$$

$$-2 \in f^{-1}(\{4, 25\}) = \{2, 5, -2, -5\}$$

$$f^{-1}(\{4, 25, 36\}) \cap f^{-1}(\{81, 4, 25\})$$

\cap
 $\begin{matrix} 4 \\ -2 \end{matrix}$

