Function Exercises

• If we have a function \( f : S \to G \), we can use it to create a directed graph \( G_f = (V_f, E_f) \). Please describe \( V_f \) and \( E_f \) using set-builder notation.

• Use the words domain/codomain, image and preimage to describe Surjective and Injective in English.

• Translate into math: “\( f : S \to G \) is injective”
Function Exercises

• If we have a function $f : S \to G$, we can use it to create a directed graph $G_f = (V_f, E_f)$. Please describe $V_f$ and $E_f$ using set-builder notation
  • $V_f = \{x : x \in S \lor x \in G\}$. $E_f = \{(x, y) : f(x) = y\}$
• Use the words domain/codomain, image and preimage to describe Surjective and Injective in English
  • Surjective: Every element of the codomain has a preimage
  • Injective: No two elements of the domain have the same image.
• Translate into math: “$f : S \to G$ is injective”
  • $\neg \exists x, y \in S : x \neq y \land f(x) = f(y)$