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FUNCTIONS & LIMITS

Exam Cog

① FUNCTIONS — DEFINITIONS

Function: every x has ONE y only
Input = x = domain **Output** = y = range
Co-domain: send set (used or not)
• **Injective:** not all co-domain used
• **Surjective:** many inputs → same output
• **Bijective:** one-to-one (inj + surj)
fog(x) = f(g(x)) — do g FIRST
Inverse $f^{-1}(x)$: swap x & y, solve for y

⚠ **WATCH:** $f^{-1}(x) \neq 1/f(x)$; fog ≠ gof

② LIMITS — 4 TYPES

Type 1: Sub x in directly
Type 2: If 0/0, factorise and cancel common factor
Type 3: Surds — × by conjugate (top or bottom)
Type 4: x → ∞ — divide above & below by HIGHEST power of x

★ *Lim(x→∞) 1/x = 0 Lim(x→0) 1/x = ∞*

Anything ÷ ∞ = 0