EngineeringRise

Functions: one-one, onto and composition

Formulas and units, JEE Main. Status: Reviewed on 2026-11-20.

Result	Formula	Units or note
All functions, m-set to n-set	n^m Valid when: m-element domain, n-element codomain	dimensionless count
One-one functions	n(n-1)...(n-m+1) (m at most n) Valid when: one-one maps, m <= n (else 0)	dimensionless count
Onto functions	sum over k of (-1)^k C(n,k) (n-k)^m Valid when: onto maps, m >= n (else 0), k from 0 to n	dimensionless count
Bijections	n! (m = n) Valid when: one-one and onto between equal finite sets	dimensionless count
Minimum of a x^2 + b x + c (a > 0)	c - b^2/(4a) at x = -b/(2a) Valid when: a > 0, x real	same as f
Composition	(f o g)(x) = f(g(x)) Valid when: g(x) in the domain of f	same as f
Inverse of a composite	(f o g)^(-1) = g^(-1) o f^(-1) Valid when: f and g bijective	function
Composition facts	f o g one-one implies g one-one; f o g onto implies f onto	n/a (statement)

Full lesson with worked examples:
https://www.engineeringrise.in/learn/learn/jee-main/mathematics/sets-relations-and-functions/functions-one-one-onto-and-compositi

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