EngineeringRise

Relations and equivalence relations

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

Result	Formula	Units or note
Relations from A to B	2^(mn) with n(A) = m, n(B) = n Valid when: n(A) = m, n(B) = n, finite sets	dimensionless count
Relations on an n-set	2^(n^2) Valid when: relations on a finite n-element set	dimensionless count
Reflexive relations	2^(n^2 - n) Valid when: relations on an n-element set	dimensionless count
Symmetric relations	2^(n(n+1)/2) Valid when: relations on an n-element set	dimensionless count
Reflexive and symmetric	2^(n(n-1)/2) Valid when: relations on an n-element set	dimensionless count
Equivalence relations	Bell numbers 1, 2, 5, 15, 52 (n = 1 to 5) Valid when: number of equivalence relations on an n-element set (partitions)	dimensionless count
Ordered pairs in an equivalence relation	sum of (class size)^2 Valid when: equivalence relation on a finite set	dimensionless count
Congruence mod m on integers	m classes: remainders 0 to m - 1 Valid when: integers, a ~ b when m divides a - b, m positive	dimensionless count

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

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