

Fundamental Theorems of Mathematics

Challenge yourself: figure out (or find out) **why** they are true

Fundamental Theorem of Arithmetic: Every positive integer has a prime factorisation, unique up to the order of the factors

Fundamental Theorem of Algebra: Every nonconstant polynomial over the field of complex numbers has at least one root

Fundamental Theorem of Calculus: For every continuous function f on an interval $[a, b]$ the function $g(x) = \int_a^x f(t) dt$ is an antiderivative of f on (a, b)

Fundamental Theorem of Linear Algebra: The row space of a matrix is orthogonal to the nullspace of the matrix, and the dimensions add up to the number of columns of the matrix