

# Advanced Proofs Package

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## 1 Introduction

This package provides advanced mathematical proofs building upon both the base-math and algebra-theorems packages.

## 2 Advanced Results

We prove more sophisticated results using the foundation laid by previous packages.

**Theorem 1.** *The product of two even numbers is divisible by 4.*

*Proof.* Let  $a$  and  $b$  be even numbers. Then  $a = 2k$  and  $b = 2m$  for some integers  $k$  and  $m$ . Therefore,  $ab = (2k)(2m) = 4km$ , which is divisible by 4.  $\square$

**Corollary 1.** *Any even number raised to an even power is divisible by 4.*