callouty-theorem Example

This example Quarto markdown file demonstrates the use of the callouty-theorem filter. For more information, see [the repository here](https://github.com/sun123zxy/quarto-callouty-theorem).

### Examples

**Proposition 1** If there exists a primitive root modulo , then there are exactly primitive roots modulo .

**Theorem 1 (Existence of primitive roots)** Primitive roots modulo exists if and only if for an odd prime and a positive integer .

*Proof* (Proof of [Proposition 1](#prp-pr-number)). We note that the primitive roots modulo is exactly the generators of the group of units modulo . By the hypothesis, the group of units modulo is cyclic, thus having generators.

*Remark*. Group theory greatly simplifies the proof of the theorem.

**Exercise 1** Prove that the quadratic residues modulo form a subgroup of the group of units modulo of index .

*Solution 1* (Solution to [Exercise 1](#exr-quadratic-residue)). Use the fact that the group of units modulo is cyclic.

### On default behaviors

**Corollary 1 (Default style)** If you set the metadata of a theorem type to default, it will be rendered like this.

**Definition 1 (Default style without title)** callout can also be set to default in the metadata.

**Conjecture 1 (As is)** Theorem types not specified in the metadata will be rendered as is.