

ZOLOTAREV'S PROOF OF GAUSS RECIPROCITY FOR JACOBI SYMBOL

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Egor Zolotarev (*Nouvelle démonstration de la loi de réciprocité de Legendre*, *Nouv. Ann. Math* (2), **11** (1872), p. 354-362) noticed that sign of permutation $x \mapsto ax \bmod p$ of the set of $\bmod p$ residues is the Legendre symbol $\left(\frac{a}{p}\right)$ and has applied this observation to his proof of Gauss Reciprocity.

Actually, the sign of permutation $x \mapsto ax \bmod n$ of the set of $\bmod n$ residues is the Jacobi symbol $\left(\frac{a}{n}\right)$ for composite n . We prove Reciprocity Law for Jacobi symbols directly, using a variant of Zolotarev reasoning.