# ERRATA FOR "RANK BIAS FOR ELLIPTIC CURVES MOD $p$" BY KIMBALL MARTIN AND THOMAS PHARIS

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Here we correct a sign error when $k \equiv 0 \bmod 4$ in Section 2 of the published article [MP22]. This has no effect on the rest of the paper.

Errata:

1. p. 710, bottom (Section 1A): the phrase "however the signs for $k \equiv 0 \bmod 4$ are opposite to those for $k \equiv 2 \bmod 4$" should be removed.
2. p. 717: The conclusion of Proposition 2.2 should read
$$\left| \operatorname{tr}_{S_k^{\mathrm{new}}(N)^{\pm}} T_n \mp \frac{1}{4} n^{\frac{k-2}{2}} H(4nN) \right| < \left( 2^{\omega(N)} (4n)^{\frac{k}{2}} + \delta_{k,2} \right) \sigma_1(n).$$
3. p. 717, proof of Proposition 2.2: $p_k(0,n) = (-n)^{(k-2)/2}$, not $n^{(k-2)/2}$, so (2-2) should read
$$\operatorname{tr}_{S_k(N)} T_n W_N = -\frac{1}{2} (-n)^{\frac{k-2}{2}} H(4nN) + \delta_{k,2} \sigma_1(n). \tag{0.1}$$
Corresponding sign changes should be made throughout of proofs of Proposition 2.2 and Corollary 2.3.
4. p. 717: The conclusion of Proposition 2.2 should read
$$\left| \operatorname{tr}_{S_k^{\mathrm{new}}(N)^{\pm}} T_n \mp \frac{1}{4} n^{\frac{k-2}{2}} H(4nN) \right| < \left( 2^{\omega(N)} (4n)^{\frac{k}{2}} + \delta_{k,2} \right) \sigma_1(n).$$
5. p. 718: The conclusion of Corollary 2.3 should read
$$N^{\frac{1}{2}-\epsilon} \ll \pm \operatorname{tr}_{S_k^{\mathrm{new}}(N)^{\pm}} T_n \ll N^{\frac{1}{2}} \log N.$$
6. p. 718, bottom: the phrase "when $k \equiv 2 \bmod 4$, and approximately like $\mp\sqrt{N}$ when $k \equiv 0 \bmod 4$" should be removed.

## References

[MP22] Kimball Martin and Thomas Pharis, *Rank bias for elliptic curves mod p*, Involve **15** (2022), no. 4, 709–726, DOI 10.2140/involve.2022.15.709. MR4536583

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