

- 1.) Let  $F$  be a non-archimedean local field. Consider  $\mathcal{O}_F$  as an  $F$ -analytic manifold, and denote by  $x: \mathcal{O}_F \rightarrow \mathcal{O}_F$  the identity function. Compute the integral

$$\int_{\mathcal{O}_F} |x dx|.$$

- 2.) Let  $p$  be a prime different from 2 and 3. Consider the affine  $\mathbb{Q}_p$ -variety  $X$  defined by the equation

$$y^2 = x^3 + p.$$

Compute<sup>1</sup>

$$\int_{X(\mathcal{O}_F)} \left| \frac{dx}{y} \right|.$$

**Optional.** Submit your solutions by e-mail to receive comments.

---

<sup>1</sup>I corrected a typo: previously I asked you to compute the integral over  $X(F)$