

VALLADOLID LECTURE 1 EXERCISE

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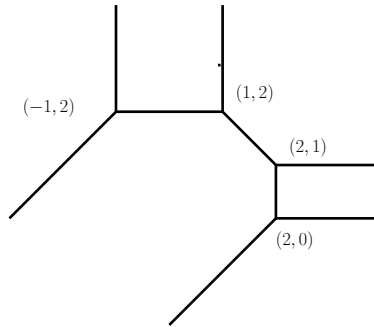
Consider the polynomial

$$f = -27x^2 - 91xy + 9y^2 + 9x + 9y + 27$$

where \mathbb{Q} has the 3-adic valuation.

- (1) What is $\text{trop}(f)$?
- (2) Verify that the diagram in Figure 1 is $\text{trop}(V(f))$.

FIGURE 1. $\text{trop}(V(f))$



- (3) Consider $I = \langle -27x^2 - 91xy + 9y^2 + 9x + 9y + 27, x - 1 \rangle$. What is $\text{trop}(V(I))$? (Hint: it may help to consider the pictures). How does this relate to our result about taking the valuations of univariate polynomials?
- (4) Draw $\text{trop}(V(f))$ for other p -adic valuations on \mathbb{Q} . Do you see a relationship between these pictures?