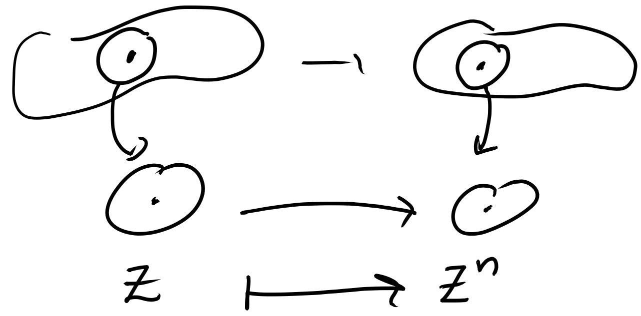
Aug 24.

Last time

1. Local normal form —



2. $\varphi : X \to Y$

   Then $\# \varphi^{-1}(y)$, counted with mult, is constant. called $\deg \varphi$.

3. 

   $\exists$ charts U_i around x_i & V around y s.t. $U_i \to V$ is $z \mapsto z^{d_i}$ and $\varphi^{-1}(V) \subset U_1 \cup \cdots \cup U_m$.

Terminology: If $\mathrm{mult}_x \varphi \geq 2$ then x is a ramification point of φ. If $y = \varphi(x)$ where x is a ram. pt, then y is a branch point of φ.

Suppose y is not a branch point. Then all $d_i = 1$ & $\varphi^{-1}(V) \to V$ is a covering space of deg d.

Riemann-Hurwitz formula:

$\varphi : X \to Y$ non constant holomorphic map of degree d.

- No unramified covers of $\mathbb{P}^1$
- Meromorphic functions
- Zeros and poles.
- mer. fun map to $\mathbb{P}^1$
- Mer. ctions on $\mathbb{P}^1$
- m fun on hyp. curves.
- $\mathrm{ord}_p(f) = 0$.
- If time permits, Fermat's last thm.

Next: No hol. functions $\rightsquigarrow$ sections of line-bundles.

Mer. functions bounded by a divisor D $\longleftrightarrow$

Divisors $\leftrightarrow$ inv. sheaves $\longleftrightarrow$ line bundles.