

$\Rightarrow$  By the argument above,  $\alpha'$  and  $\beta'$  are relatively prime.

$\Rightarrow \alpha' \& \beta'$  have no common components. But if we assume that  $(\gamma'=0) \neq \pi(W)$ , then  $\alpha' \& \beta'$  have a common component, as follows:

For some  $z' \in \mathbb{C}^{n-1}$ , <sup>Assume</sup>  $\gamma'(z')=0$ , and  $f$  and  $g$  have no common zeros along the line  $\pi^{-1}(z')$ .  $\Rightarrow \alpha'$  vanishes at all the zeros of  $g$  in  $\pi^{-1}(z')$ ; since  $\deg \alpha' < \deg g$ , this implies that  $\alpha'$ , and hence  $\beta'$ , vanish identically on  $\pi^{-1}(z')$ . Thus  $\alpha'$  and  $\beta'$  both are zero on the inverse image of any component of the zero locus of  $\gamma'$  other than  $\pi(W)$ . Remember  $(\gamma'=0) - \pi(W)$  is open in  $(\gamma'=0)$ .  $\square$

We see then that  $\pi(W)$  is an analytic hypersurface in a nbd of the origin in  $\mathbb{C}^{n-1}$ , and, reiterating our basic description of analytic hypersurfaces, that projection of  $W$  onto a suitable chosen  $(n-2)$ -plane  $\mathbb{C}^{n-2} \subset \mathbb{C}^n$  expresses  $W$  locally as a finite-sheeted branched cover of a nbd of the origin in  $\mathbb{C}^{n-2}$ .

$$\begin{array}{ccc} W & \longrightarrow & \mathbb{C}^{n-1} \longrightarrow \mathbb{C}^{n-2} \\ & & \downarrow \quad \downarrow \\ & & \pi(W) = (\gamma'=0) \xrightarrow{\pi} \pi(\gamma'=0) = \text{nbd of } 0 \end{array}$$

if we assume that  $(\gamma'=0)$  does not contain the  $z_{n-1}$ -axis. See P9, the statement above <sup>the</sup> Riemann Extension Theorem.  $\square$