Writing $z_i = x_i + \sqrt{-1}\, y_i$, the natural orientation on M is given by basis

$$\left(\frac{\partial}{\partial x_1}, \frac{\partial}{\partial y_1}, \quad \frac{\partial}{\partial x_n}, \frac{\partial}{\partial y_n}\right)$$

for $T_p(M)$, while the natural orientations for V and W are given by

$$\left(\frac{\partial}{\partial x_1}, \frac{\partial}{\partial y_1}, \cdots \frac{\partial}{\partial x_k}, \frac{\partial}{\partial y_k}\right)$$

and

$$\left(\frac{\partial}{\partial x_{k+1}}, \frac{\partial}{\partial y_{k+1}}, \cdots \frac{\partial}{\partial x_n}, \frac{\partial}{\partial y_n}\right).$$

We see, then, that if V, W and M are all given the natural orientations,

$$\iota_p(V \cdot W) = +1.$$

This trivial observation, that the intersection index of two analytic subvarieties meeting transversely is always positive, is in fact one of the cornerstones of algebraic geometry. It relates the set-theoretic intersection of two varieties - a priori a geometric invariant - to the intersection number - a topological invariant - and so provides a basic link.

「 geometric invariant $\#(V \cdot W) = 1$ $\uparrow\downarrow$
topological " $\#(V \cap W) = 1$. 」

Before we can fully utilize this bond, however, we have to extend it to varieties that may not intersect transversely. This goes as follows