$\subset M - f^{-1}(V) - W$. For any $x \in \mathbb{P}^n - V - g^{-1}(W)$, $g(x) \in M$. $g(x) \notin W \Rightarrow g(x) \in M - W$. Suppose $g(x) \in f^{-1}(V) \Rightarrow f(g(x)) = x \in V \Rightarrow$ Contradiction to the fact $x \notin V$. We can not go further. $\mathbb{C}^2 \xrightarrow{\pi} \mathbb{C}$ and $\mathbb{C} \xrightarrow{g} \mathbb{C}^2$, $z \longmapsto (z, 1)$

$\Rightarrow \mathbb{C} \xrightarrow{\pi \circ g} \mathbb{C}$ is identity. $\Rightarrow \mathbb{C}^2$ is birational to $\mathbb{C}$ according to the definition above. Nonsense!!! (or $\mathbb{P}^1 \times \mathbb{P}^1 \xrightarrow{\pi} \mathbb{P}^1$ is birational)

We have to correct as follows:

We say that a rational map $f: M \longrightarrow N$ is birational if there exists a rational map $g: N \longrightarrow M$ s.t $f \circ g$ & $g \circ f$ are the identies as rational maps.

$M \xrightarrow{f} \mathbb{P}^n$ birational $\Rightarrow \mathbb{P}^n \xrightarrow{g} M$ rational s.t $g \circ f$ & $f \circ g = \mathrm{id}$ as rational maps.

$\Rightarrow \quad g \circ f : M \longrightarrow \mathbb{P}^n \longrightarrow M$.

$\Rightarrow \quad g \circ f : M - W \longrightarrow \mathbb{P}^{n - g^{-1}(W)} \longrightarrow M - W$ is holomorphic

Similarly, $f \circ g = \mathrm{id} : \mathbb{P}^n - V \to M - f^{-1}(V) \longrightarrow \mathbb{P}^n - V$.

Consider the following maps

$$g \circ f : M - W - f^{-1}(V) \underset{1-1}{\xrightarrow{f}} \mathbb{P}^n - V - g^{-1}(W) \xrightarrow{g} M - W - f^{-1}(V)$$

$$f \circ g : \mathbb{P}^n - V - g^{-1}(W) \underset{1-1}{\xrightarrow{g}} M - W - f^{-1}(V) \xrightarrow{f} \mathbb{P}^n - V - g^{-1}(W)$$

We have only to prove that $f(M - W - f^{-1}(V)) \subset \mathbb{P}^n - V - g^{-1}(W)$,

($x \in M - W - f^{-1}(V)$. $\Rightarrow$ $f(x) \notin V$, and $f(x) \notin g^{-1}(W)$, since $g(f(x)) = x \in W$.),