

STEREOGRAPHIC PROJECTION

Why

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Definition

Let S be the sphere in \mathbf{R}^3 and let N=(0,0,1), the north pole. Then the stereopgraphic projection of $S-\{N\}$ is the function $\pi:S-\{N\}\to\mathbf{R}^2$ defined as follows. The point $\pi(p)$ is the (x,y) values for the point where the line through N and p intersects the plane plane $P=\{(x,y,z)\in\mathbf{R}^3\}z=0$ (the "xy-plane").²

Proposition 1. The stereographic projection is a diffeomorphism.

¹Future editions will include, the historical motivation is obviously cartography.

²Future editions will expand.

