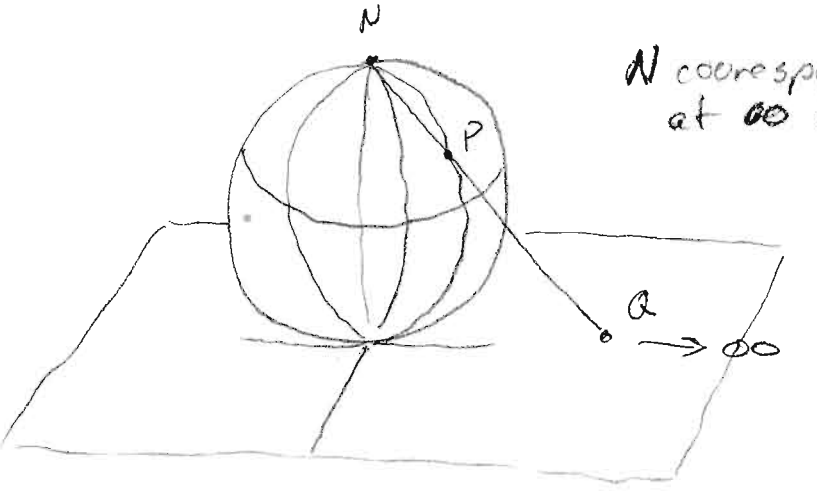
Point at ∞; Residues of ∞

As $Q \to \infty$, $P \to N$



N corresponds to the point at ∞ in the complex plane

$$\oint_C f(z)\,dz = 2\pi i\, R(z) \quad \leftarrow \text{Integration around } \infty.$$

[Traverse clockwise for area outside C.

Let $z = \frac{1}{z}$, $dz = -\frac{1}{z^2}\,dz$

$$\int_{C'} -\frac{1}{z^2} f\left(\frac{1}{z}\right) dz = 2\pi i\, R(z)$$

$$\underset{z\to\infty}{R(z)} = -\left(\underset{z\to 0}{R}\left(\frac{1}{z^2} f\left(\frac{1}{z}\right)\right)\right)$$

$$= -1$$