

Hyperbolic plane

The length of the curve $(x(t), y(t))$ where $a \leq t \leq b$ is

$$\int_a^b \frac{\sqrt{(x'(t))^2 + (y'(t))^2}}{y(t)} dt$$

The distance between two points is the length of the curve with minimal length. If two points $P=a+ib$ and $Q=a+ic$ are on a vertical line then the distance between them is:
 $|\ln(c/b)|$.

Lines in hyperbolic geometry could be described as objects from euclidean geometry:

- 1) Half-lines from euclidean geometry perpendicular to the real line.
- 2) Half-circles from euclidean geometry with the center on the real line.

