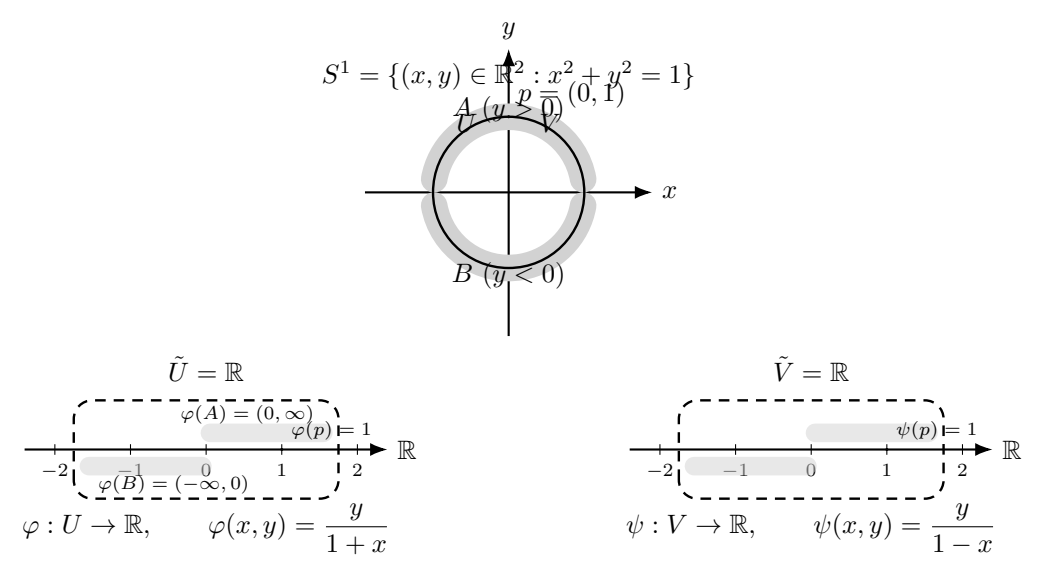
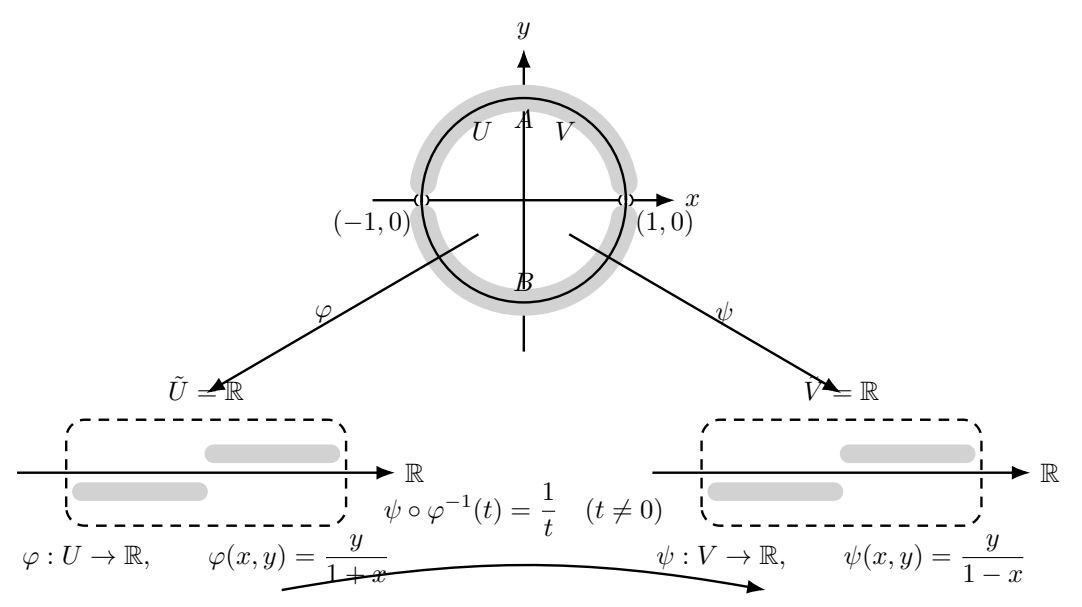

y
$S^1 = \{(x, y) \in \mathbb{R}^2 : x^2 + y^2 = 1\}$
p
$(0, 1)$
$A\ (y > 0)$
U
V
x
$B\ (y < 0)$
$\tilde{U} = \mathbb{R}$
$\varphi(A) = (0, \infty)$
$\varphi(p) = 1$
$\mathbb{R}$
-2
-1
0
1
2
$\varphi(B) = (-\infty, 0)$
$\varphi : U \to \mathbb{R}, \qquad \varphi(x, y) = \dfrac{y}{1 + x}$
$\tilde{V} = \mathbb{R}$
$\psi(p) = 1$
$\mathbb{R}$
-2
-1
0
1
2
$\psi : V \to \mathbb{R}, \qquad \psi(x, y) = \dfrac{y}{1 - x}$


y
x
U
A
V
(−1, 0)
(1, 0)
B
φ
ψ
$\tilde{U} = \mathbb{R}$
$V = \mathbb{R}$
$\mathbb{R}$
$\mathbb{R}$
$\psi \circ \varphi^{-1}(t) = \frac{1}{t} \quad (t \neq 0)$
$\varphi : U \to \mathbb{R}, \qquad \varphi(x, y) = \frac{y}{1 + x}$
$\psi : V \to \mathbb{R}, \qquad \psi(x, y) = \frac{y}{1 - x}$