

- (1) Determine the Jacobian of

$$x = u^2 + v^2 \quad y = u^2 - v^2$$

- (2) From Section 16.9: 12, 14, 20, and 22.  
(= 12, 14, 20, and 22 in the 5th ed.)

- (3) Let  $D$  denote the region in the half-plane  $x > 0$  determined by the inequalities  $1 \leq x^2 - y^2 \leq 2$ . Determine

$$\iint \frac{dA}{x^2 + y^2}$$

by changing variables as follows:  $x = u \cosh(t)$  and  $y = u \sinh(t)$ .