

9.30.

$$\mathbf{F}(x, y) = (x^3 - 3xy^2, y^3 - 3x^2y)$$

$$\frac{\partial}{\partial y}(x^3 - 3xy^2) = -6xy, \quad \frac{\partial}{\partial x}(y^3 - 3x^2y) = -6xy$$

$$\mathit{grad}U(x, y) = \mathbf{F}(x, y) = (x^3 - 3xy^2, y^3 - 3x^2y)$$

$$U_x(x, y) = x^3 - 3xy^2 \quad U(x, y) = \frac{x^4}{4} - \frac{3}{2}x^2y^2 + g(y)$$

$$U_y(x, y) = y^3 - 3x^2y \quad U_y(x, y) = -3x^2y + g'(y)$$

$$g'(y) = y^3, \quad g(y) = \frac{y^4}{4} + C$$

SVAR:

$$U(x, y) = \frac{x^4}{4} - \frac{3}{2}x^2y^2 + \frac{y^4}{4} + C$$