$$U(x,y) = y \left[-2 \, \frac{\ln(\cosh x)}{x^2} + \frac{x - \tanh x}{x^2} \, y + \frac{\tanh x}{x} \, (2 - y \, \tanh x) \right]$$
$$= y \left[1 + \frac{2}{9} \, x^4 - \left(\frac{2}{3} \, x - \frac{8}{15} \, x^3 \right) y \right] + [5]$$

$$V(x,y) = 2 \, \frac{\ln(\cosh x)}{x} + 2 \, \frac{\tanh x - x}{x} \, y$$
$$= x \left[1 - \frac{1}{3} \, x^2 - \left(\frac{2}{3} \, x - \frac{4}{15} \, x^3 \right) y \right] + [5]$$