

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

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