$$A = \left(\frac{\partial p}{\partial \varrho}\right)_T, \quad B = \left(\frac{\partial p}{\partial T}\right)_\varrho, \quad C = \left(\frac{\partial s}{\partial \varrho}\right)_T, \quad D = \left(\frac{\partial s}{\partial T}\right)_\varrho \tag{1}$$

$$\left(\frac{\partial p}{\partial \varrho}\right)_s = \left(\frac{\partial p}{\partial \varrho}\right)_T - \left(\frac{\partial p}{\partial T}\right)_\varrho \left(\frac{\partial s}{\partial \varrho}\right)_T \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho = A - \frac{B \cdot C}{D} \tag{2}$$

$$\left(\frac{\partial^2 p}{\partial \varrho^2}\right)_s = \left(\frac{\partial A}{\partial \varrho}\right)_s - \frac{\left(\frac{\partial B}{\partial \varrho}\right)_s CD + B\left(\frac{\partial C}{\partial \varrho}\right)_s D - BC\left(\frac{\partial D}{\partial \varrho}\right)_s}{D^2} \tag{3}$$

$$= \left(\frac{\partial A}{\partial \varrho}\right)_s - \left(\frac{\partial B}{\partial \varrho}\right)_s \frac{C}{D} - \left(\frac{\partial C}{\partial \varrho}\right)_s \frac{B}{D} + \left(\frac{\partial D}{\partial \varrho}\right)_s \frac{BC}{D^2} \tag{4}$$

$$\left(\frac{\partial A}{\partial \varrho}\right)_s = \left(\frac{\partial^2 p}{\partial \varrho^2}\right)_T - \left(\frac{\partial^2 p}{\partial T \partial \varrho}\right)\left(\frac{\partial s}{\partial \varrho}\right)_T \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho \tag{5}$$

$$\left(\frac{\partial B}{\partial \varrho}\right)_s = \left(\frac{\partial^2 p}{\partial T \partial \varrho}\right) - \left(\frac{\partial^2 p}{\partial T^2}\right)_\varrho \left(\frac{\partial s}{\partial \varrho}\right)_T \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho \tag{6}$$

$$\left(\frac{\partial C}{\partial \varrho}\right)_s = \left(\frac{\partial^2 s}{\partial \varrho^2}\right)_T - \left(\frac{\partial^2 s}{\partial T \partial \varrho}\right)\left(\frac{\partial s}{\partial \varrho}\right)_T \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho \tag{7}$$

$$\left(\frac{\partial D}{\partial \varrho}\right)_s = \left(\frac{\partial^2 s}{\partial T \partial \varrho}\right) - \left(\frac{\partial^2 s}{\partial T^2}\right)_\varrho \left(\frac{\partial s}{\partial \varrho}\right)_T \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho \tag{8}$$

$$\begin{aligned}\left(\frac{\partial^2 p}{\partial \varrho^2}\right)_s = \left(\frac{\partial^2 p}{\partial \varrho^2}\right)_T &- \left[\left(\frac{\partial p}{\partial T}\right)_\varrho \left(\frac{\partial^2 s}{\partial \varrho^2}\right)_T + 2\left(\frac{\partial^2 p}{\partial T \partial \varrho}\right)\left(\frac{\partial s}{\partial \varrho}\right)_T\right] \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho \\ &+ \left[\left(\frac{\partial^2 p}{\partial T^2}\right)_\varrho \left(\frac{\partial s}{\partial \varrho}\right)_T^2 + 2\left(\frac{\partial p}{\partial T}\right)_\varrho \left(\frac{\partial s}{\partial \varrho}\right)_T \left(\frac{\partial^2 s}{\partial T \partial \varrho}\right)\right] \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho^2 \\ &- \left[\left(\frac{\partial p}{\partial T}\right)_\varrho \left(\frac{\partial s}{\partial \varrho}\right)_T^2 \left(\frac{\partial^2 s}{\partial T^2}\right)_\varrho\right] \Bigg/ \left(\frac{\partial s}{\partial T}\right)_\varrho^3\end{aligned} \tag{9}$$