$$\left(\frac{\partial a}{\partial v}\right)_c = -\varrho^2 \left(\frac{\partial a}{\partial \varrho}\right)_c$$

$$\left(\frac{\partial a}{\partial \varrho}\right)_c = -v^2 \left(\frac{\partial a}{\partial v}\right)_c$$

$$\left(\frac{\partial v}{\partial b}\right)_c = -\frac{1}{\varrho^2} \left(\frac{\partial \varrho}{\partial b}\right)_c$$

$$\left(\frac{\partial \varrho}{\partial b}\right)_c = -\frac{1}{v^2} \left(\frac{\partial v}{\partial b}\right)_c$$

$$\left(\frac{\partial^2 a}{\partial v^2}\right)_c = 2\varrho^3 \left(\frac{\partial a}{\partial \varrho}\right)_c + \varrho^4 \left(\frac{\partial^2 a}{\partial \varrho^2}\right)_c$$

$$\left(\frac{\partial^2 a}{\partial \varrho^2}\right)_c = 2v^3 \left(\frac{\partial a}{\partial v}\right)_c + v^4 \left(\frac{\partial^2 a}{\partial v^2}\right)_c$$

$$\left(\frac{\partial^2 v}{\partial b^2}\right)_c = \frac{2}{\varrho^3} \left(\frac{\partial \varrho}{\partial p}\right)_T - \frac{1}{\varrho^2} \left(\frac{\partial^2 \varrho}{\partial p^2}\right)_T$$

$$\left(\frac{\partial^2 \varrho}{\partial b^2}\right)_c = \frac{2}{v^3} \left(\frac{\partial v}{\partial p}\right)_T - \frac{1}{v^2} \left(\frac{\partial^2 v}{\partial p^2}\right)_T$$