In this and the following 5 questions, the partial derivative $\left(\frac{\partial a}{\partial P}\right)_g$ must be rewritten to measurable quantities ($T, v, Ts, \beta, \kappa, c_p$). This is done in a few steps:

Step 1: Use $da = -sdT - Pdv$ to rewrite the partial derivative to a form of $\left(\frac{\partial a}{\partial P}\right)_g = ... \left(\frac{\partial T}{\partial P}\right)_g + ... \left(\frac{\partial v}{\partial P}\right)_g$. What are the values on the dots?

da = -sdT - Pdv = $\left(\frac{\partial a}{\partial T}\right)_v dT + \left(\frac{\partial a}{\partial v}\right)_T dv$

$$\left(\frac{\partial a}{\partial P}\right)_g = \left(\frac{\partial a}{\partial T}\right)_v \left(\frac{\partial T}{\partial P}\right)_g + \left(\frac{\partial a}{\partial v}\right)_T \left(\frac{\partial v}{\partial P}\right)_g = -s \left(\frac{\partial T}{\partial P}\right)_g - P \left(\frac{\partial v}{\partial P}\right)_g$$