

## 1 Gibbs free energy

The Gibbs free energy,  $G$ , is given by

$$G = U + pV - TS.$$

- (a) Find the total differential of  $G$ . As always, show your work.
- (b) Interpret the coefficients of the total differential  $dG$  in order to find a derivative expression for the entropy  $S$ .
- (c) From the total differential  $dG$ , obtain a different thermodynamic derivative that is equal to

$$\left(\frac{\partial S}{\partial p}\right)_T$$