This is just a test for testing 'TAATemplate' documentclass. Now I want to create some questions with ExSheets package:

1- Calculate exact differential of $U = U(T, P)$ 2 P

Solution 1- To show how can we calculate the exact differential of U, continue as below:

$$\mathrm{d}U = \left(\frac{\partial U}{\partial T}\right)_P \mathrm{d}T + \left(\frac{\partial U}{\partial P}\right)_T \mathrm{d}P$$

2- In this question we want to: 1 P

a) Calculate thermodynamic work in a hydrostatic system

b) Calculate transfered heat by an ideal gas

Solution 2-

a)

$$đW = -P\mathrm{d}V \Rightarrow W = -\int_{V_i}^{V_f} P\ \mathrm{d}V$$

b)

$$đQ = \mathrm{d}U - đW = C_V \mathrm{d}T + P\mathrm{d}V \Rightarrow Q = \int_{T_i}^{T_f} C_V\ \mathrm{d}T + \int_{V_i}^{V_f} P\ \mathrm{d}V$$