

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:

$$dU = \left( \frac{\partial U}{\partial T} \right)_P dT + \left( \frac{\partial U}{\partial P} \right)_T dP$$

**2-** In this question we want to:

1 P

- a) Calculate thermodynamic work in a hydrostatic system
- b) Calculate transferred heat by an ideal gas

**Solution 2-**

a)

$$dW = -PdV \Rightarrow W = - \int_{V_i}^{V_f} P dV$$

b)

$$dQ = dU - dW = C_V dT + PdV \Rightarrow Q = \int_{T_i}^{T_f} C_V dT + \int_{V_i}^{V_f} P dV$$