Carbon dioxide is contained in a piston-cylinder assembly and undergoes an isothermal process. The initial pressure and temperature are 0.738 MPa and 1247.35°C respectively, and the mass is 0.1 kg. The final pressure is 0.1 MPa.

1. Compute the compressibility factor $Z$ and determine whether the perfect gas law is applicable at the beginning and end states.

2. Find the work done in the process in kJ. Is work being done on the system or by the system?