Chapter 7 Question #9

Gas is confined to one side of a thermally-insulated container by a thin diaphragm. The diaphragm is broken and the system is allowed to come to thermodynamic equilibrium at state 2.

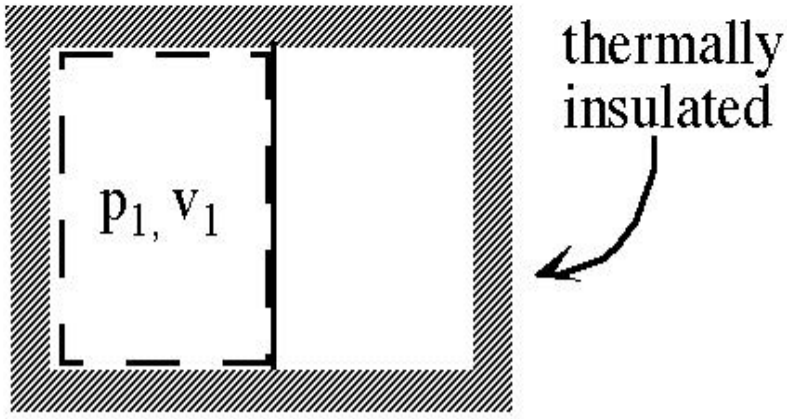
Which of the following is true?

1) $T_1 > T_2$

2) $T_1 = T_2$

3) $T_1 < T_2$

4) I am not sure



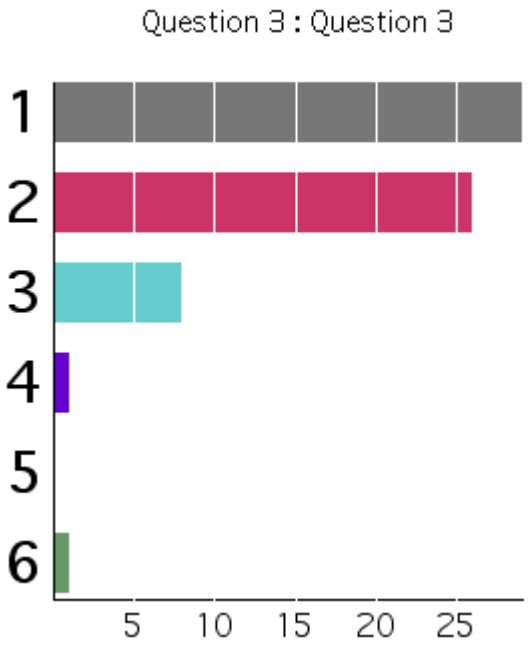
LO#5

Chapter 7 Question 9 Answer:

(2) $T_1 = T_2$

From the First Law, $\Delta u = q - w$. $q=0$ since the container is thermally-insulated. $w=0$ since the container is rigid (or if you draw your system around the gas, because the external pressure = 0). Therefore, $\Delta u=0$. So for an ideal gas then, the temperature is constant since $du=c_v dT$.

Class Response (2003):



Class Response (2002):