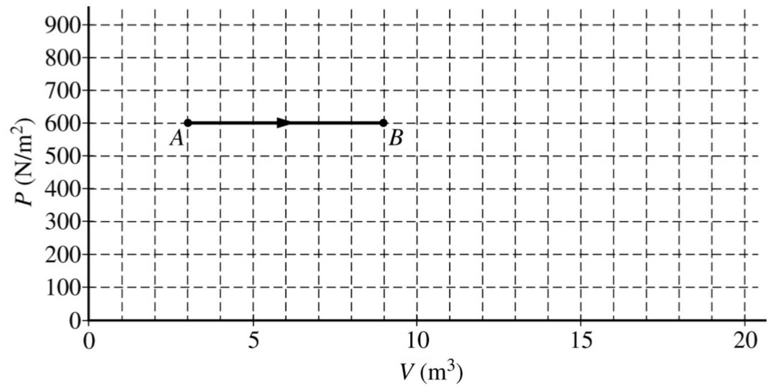

8. The diagram above of pressure P vesus volume V shows the expansion of 2.0 moles of monatomic ideal gas from state A to state B. As shown in the diagram, $P_A = P_B = 600$ N/m^2, $V_A = 3.0$ m^3, and $V_B = 9.0$ m^3.

   (a) i. Calculate the work done *by the gas* as it expands.

   ii. Calculate the change in internal energy of the gas as it expands.

   iii. Calculate the heat added to or removed from the gas during this expansion.

   (b) The pressure is then reduced to 200 N/m^2 without changing the volume as the gas is taken from state B to state C. Locate state C on the graph, and draw a line or a curve to represent the process through which the gas changes from state B to state C.

   (c) The gas is then compressed isothermally back to state A.

   i. Draw a line or curve on the diagram to represent this process.

   ii. Is heat added to or removed from the gas during this isothermal compression?
   Added to / Removed from
   Justify your answer.