The pressure-volume behavior for one simple model of an IC engine is composed of four steps (processes). The first process has the relationship $p v^{1.4} = \alpha$, where the initial and final specific volumes are $v_1$ and $v_2$, respectively. It is followed by $v = v_2$, $p v^{1.4} = \beta$, and $v = v_1$. The initial and final specific volumes for the third process are respectively $v_2$ and $v_1$. $\alpha$ and $\beta$ are constants.

**Calculate the moving boundary work for each of the four processes.** Report answers in terms of $p_1$, $p_2$, $v_1$, and $v_2$.

**Now sketch the four sequential processes on a p-v plot.** Use $p$ as the vertical axis and $v$ as the horizontal one.