

Consider an ideal monatomic gas, which means  $U = \frac{3}{2}Nk_B T$  and  $pV = Nk_B T$ . The number of gas molecules  $N$  is constant.

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Find the efficiency of this gas cycle as a heat engine, and compare to the Carnot limit.

*For this question, the specific value of  $N$  doesn't matter.*