Q1 A 33.0 moles of an ideal gas starting at point A is carried around the cycle shown in the Figure. In the process, the gas does 13 × 105 J of work. Find the gas temperature at point A.

A

PA

3x105

P (Pa)

V (m3)

1

3

$$n=33 mol$$

$$W=3.5×10^{5}J$$

$$W=the area under the P vs V graph$$

$$ =\left(3-1\right)×\left(P\_{A}-3×10^{5}\right)=13×10^{5} J$$

$$2P\_{A}=6×10^{5}+13×10^{5} ⇒ P\_{A}= 9.5×10^{5} Pa$$

$But P\_{A}V\_{A}=nRT\_{A} the equation of ideal gas law at point A $

$$ T\_{A}=\frac{P\_{A}V\_{A}}{nR}=\frac{9.5×10^{5}×1}{33×8.31}=3464 K $$