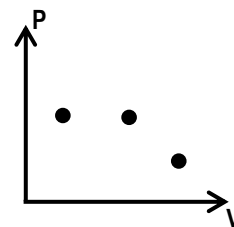


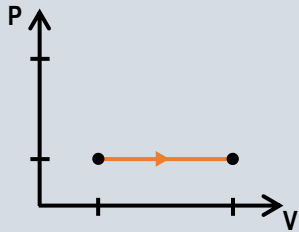
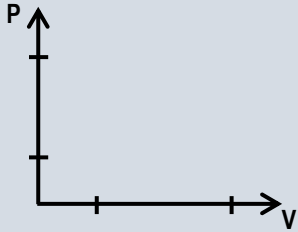
CONCEPT: CALCULATING WORKS FOR MULTIPLE THERMODYNAMIC PROCESSES

- Many problems will have a system going through multiple thermodynamic processes.
 - The total work done over *multiple* processes is the _____ of all works done in each process.

$$W_{tot} = \underline{\hspace{2cm}}$$

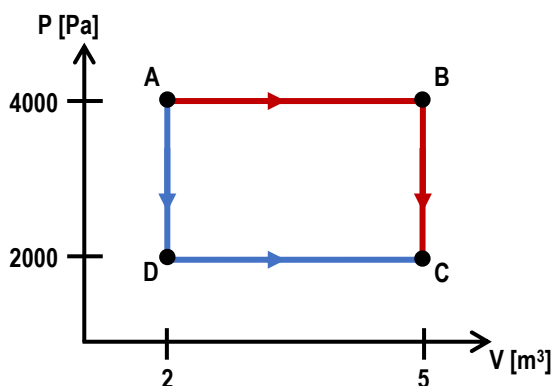


- There are 4 special thermodynamic processes you'll need to know:

SPECIAL THERMODYNAMIC PROCESSES			
Isobaric (Constant $\underline{\hspace{1cm}}$)	Isovolumetric (Constant $\underline{\hspace{1cm}}$) a.k.a. "Isochoric"	Isothermal	Adiabatic
 Straight Horizontal line	 Straight _____ line		
ΔE_{int}			
Q			
W	$P\Delta V$		

EXAMPLE: 3 moles of an ideal gas are in a container.

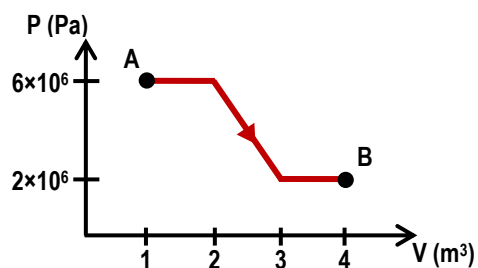
- Calculate the total work done by the gas for the $A \rightarrow B \rightarrow C$ path.
- Calculate the total work done by the gas for the $A \rightarrow D \rightarrow C$ path.



- The Work done between 2 states depends on the _____ taken.

PROBLEM: How much work is done by a gas that expands from A to B along the path shown below?

- A) $9 \times 10^7 \text{ J}$
- B) $3.6 \times 10^7 \text{ J}$
- C) $3.3 \times 10^7 \text{ J}$
- D) $1.2 \times 10^7 \text{ J}$

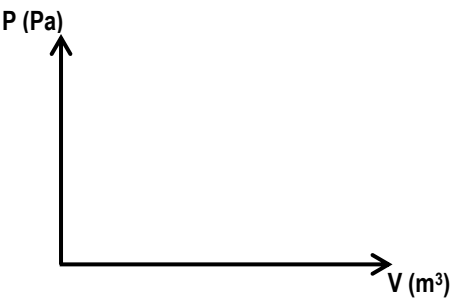


	Iso-P	Iso-V	Iso-T	Adiab.
ΔE_{int}				
Q				
W	$P\Delta V$	0		

Rectangle	Triangle	Trapezoid
$A = b \cdot h$	$A = \frac{1}{2} b \cdot h$	$A = \frac{1}{2} (b_1 + b_2) \cdot h$

PROBLEM: A gas with an initial volume of 0.2 m^3 is heated at constant volume, and the pressure increases from $2\times 10^5\text{ Pa}$ to 5×10^5 . Then, it compresses at constant pressure until it reaches a final volume of 0.12 m^3 . Draw the two processes in the PV diagram below and find the total work done by the gas.

- A) $-1.6\times 10^4\text{ J}$
- B) $4\times 10^4\text{ J}$
- C) 0 J
- D) $-4\times 10^4\text{ J}$



	Iso- <i>P</i>	Iso- <i>V</i>	Iso- <i>T</i>	Adiab.
ΔE_{int}				
Q				
W	$P\Delta V$	0		