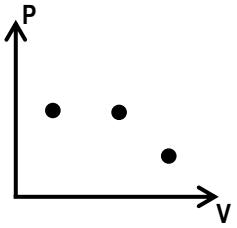
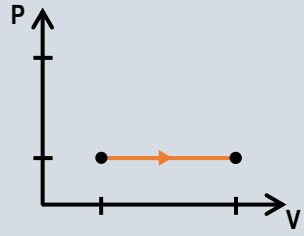
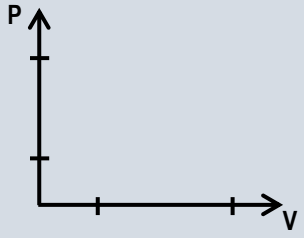
CONCEPT: CALCULATING WORKS FOR MULTIPLE THERMODYNAMIC PROCESSES



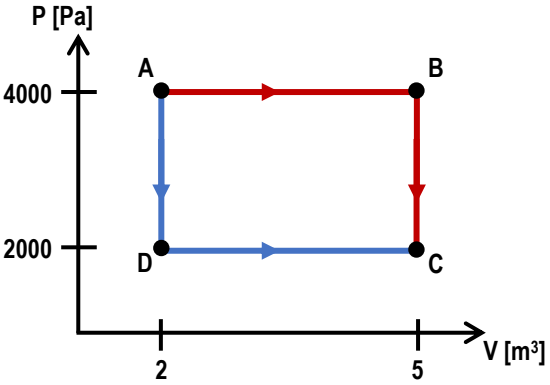
- Many problems will have a system going through multiple thermodynamic processes.
  - The total work done over *multiple* processes is the _____ of all works done in each process.

W_{tot} = _____

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

SPECIAL THERMODYNAMIC PROCESSES			
Isobaric (Constant __)	**Isovolumetric (Constant __)** a.k.a. "*Isochoric*"	**Isothermal**	**Adiabatic**
 • Straight Horizontal line	 • Straight _____ line		
ΔE_{int}			
Q			
W	$P\Delta V$	____	

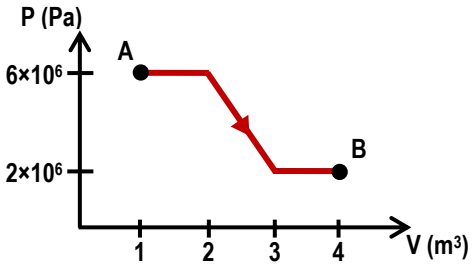
EXAMPLE: 3 moles of an ideal gas are in a container.
a) Calculate the total work done by the gas for the ***A→B→C*** path.
b) Calculate the total work done by the gas for the ***A→D→C*** path.

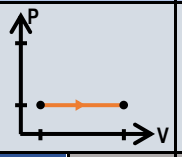
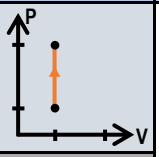


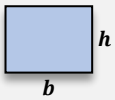
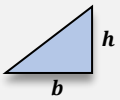
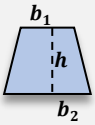
- The Work done between 2 states depends on the _____ taken.

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

A) 9×10^7 J
B) 3.6×10^7 J
C) 3.3×10^7 J
D) 1.2×10^7 J

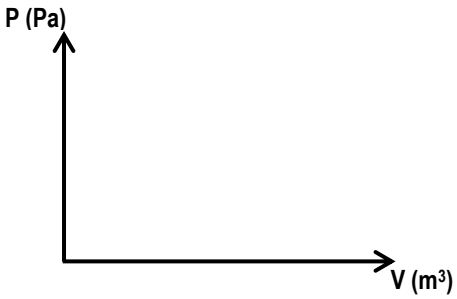


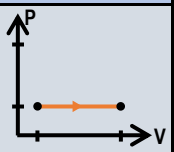
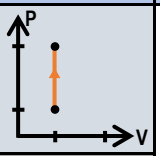
Iso-P	Iso-V	Iso-T	Adiab.
			
ΔE_{int}			
Q			
W	$P\Delta V$	0	

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 2×10^5 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) -1.6×10^4 J
B) 4×10^4 J
C) 0 J
D) -4×10^4 J



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