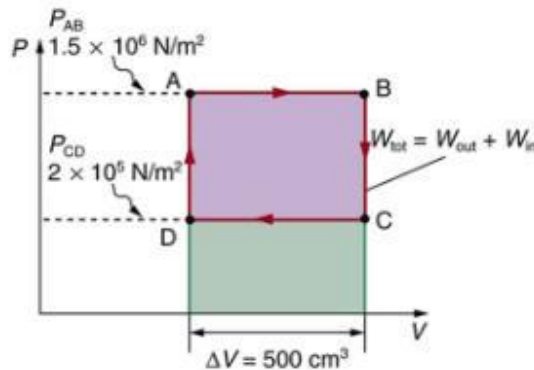


## Homework #2

### Physics, summer 2020/21

- 1) **(4pkt)** Examine the total work done in the cyclical process ABCDA shown in Figure (Take the data in the figure to be precise to three significant figures.)



- Calculate the work done along each segment of the path and add these values to get the total work.
  - Calculate the area inside the rectangle ABCDA. Do you expect such result? Why?
- 2) **(6pkt)** Archimedes' principle can be used to calculate the density of a fluid as well as that of a solid. Suppose a chunk of iron with a mass of 390.0 g in air is found to have an apparent mass of 350.5 g when completely submerged in an unknown liquid.
- What mass of fluid does the iron displace?
  - What is the volume of iron, using its density as given in Table.
  - Calculate the fluid's density and identify it.

Substance	$\rho$ (g/mL)	Substance	$\rho$ (g/mL)	Substance	$\rho$ (g/mL)
<b>Solids</b>		<b>Liquids</b>		<b>Gases</b>	
Aluminum	2.7	Water (4°C)	1.000	Air	$1.29 \times 10^{-3}$
Brass	8.44	Blood	1.05	Carbon dioxide	$1.98 \times 10^{-3}$
Copper (average)	8.8	Sea water	1.025	Carbon monoxide	$1.25 \times 10^{-3}$
Gold	19.32	Mercury	13.6	Hydrogen	$0.090 \times 10^{-3}$
Iron or steel	7.8	Ethyl alcohol	0.79	Helium	$0.18 \times 10^{-3}$
Lead	11.3	Petrol	0.68	Methane	$0.72 \times 10^{-3}$
Polystyrene	0.10	Glycerin	1.26	Nitrogen	$1.25 \times 10^{-3}$
Tungsten	19.30	Olive oil	0.92	Nitrous oxide	$1.98 \times 10^{-3}$