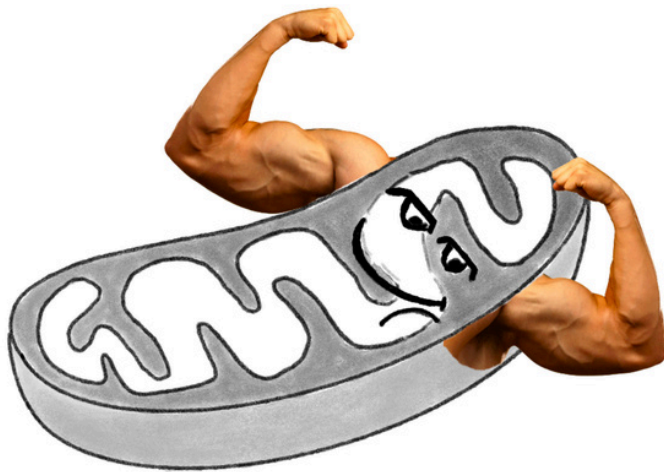


AP PHYSICS 2

FIRST LAW OF THERMODYNAMICS

REVIEW



FIRST LAW

Heat added to
a system

$$\Delta U = Q + W$$

change in
internal energy

work done
ON a gas

- Work done ON a gas is + in compression, - in expansion
- Q is + in heating & - in cooling

PROCESSES

→ Isothermal: constant temp, $\Delta U = 0$

- $\Delta U = Q + W$, $Q = -W$

→ Adiabatic: no heat exchange, $Q = 0$

- $\Delta U = Q + W$, $\Delta U = W$

→ Isochoric: constant volume, $W = 0$

- $\Delta U = Q + W$, $\Delta U = Q$

→ Isobaric: constant pressure, $W = P\Delta V$

- $\Delta U = Q + W$

PV DIAGRAMS

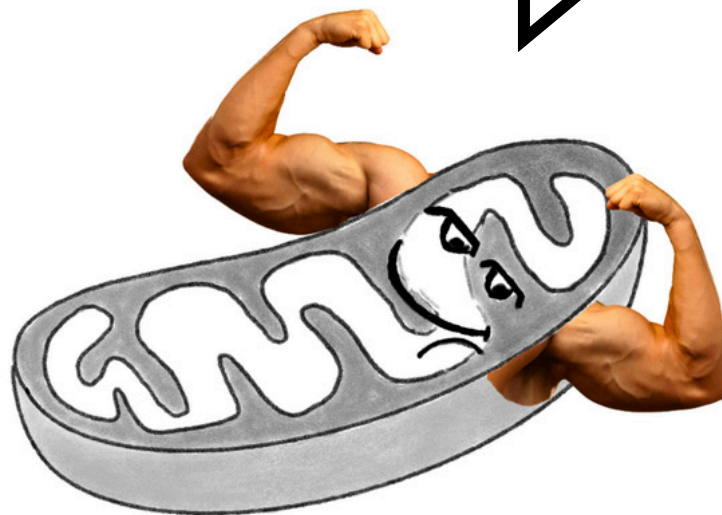
→ **area** under a curve = **work**

→ cycle: area of closed loop
= work

- clockwise direction, negative net work done **ON** gas

- counterclockwise, positive net work done **ON** gas

**follow for
more!**



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