**Videos 15H - Adiabatic PV Name**

For an adiabatic process (Q = 0, so compression raises temperature, expansion lowers temperature)



**Example: Gas in a piston has a volume of 1.200 liters and a pressure of 1.00x105 Pa.**

a. If it is compressed isothermally (constant temperature) to a volume of 0.800 liters, what is the new pressure? (1.50x105 Pa)

b. If it is compressed adiabatically (no heat flow – Quickly?) to 0.800 liters, what is the new pressure? (1.97x105 Pa)

Why does the adiabatic process result in a higher pressure?

Whiteboards: (These are solved on the website in the videos linked after the main one)

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| 1. Gas in a cylinder at a pressure of 1.013x105 Pa and a volume of 0.150 m3 is expanded quickly (adiabatically) to a volume of 0.810 m3. What is the new pressure? (6090 Pa) | 2. Gas in a cylinder at a pressure of 9820 Pa and a volume of 0.0450 m3 is expanded quickly (adiabatically) so the pressure drops to 7510 Pa. What is the new volume? (0.0529 m3 ) |
| 3. Gas in a cylinder is at 12.0 psi when the piston is 10.00 cm from the bottom. If it is quickly (adiabatically) compressed to a height of 5.00 cm, what is the new pressure? (38.1 psi) | 4. Gas in a cylinder is at 760. Torr when the piston is 8.00 inches from the bottom. If you quickly move the piston out to make the pressure 380. Torr, how high is the piston? (Cut the pressure in half) (12.1 inches) |