

# Equation for Process Calculation for Ideal Gas.



- ❖ Process Calculations provide work and heat quantities.
- ❖ **Work** of mechanically reversible closed system process.

$$dW = -P dV$$

$$dQ + dW = C_v dT$$

- ❖ The first law equation for an ideal gas.
- ❖ Substitution for  $dW$  and solve for  $dQ$  yields an equation valid for an ideal gas.

$$dQ = C_v dT + P dV$$

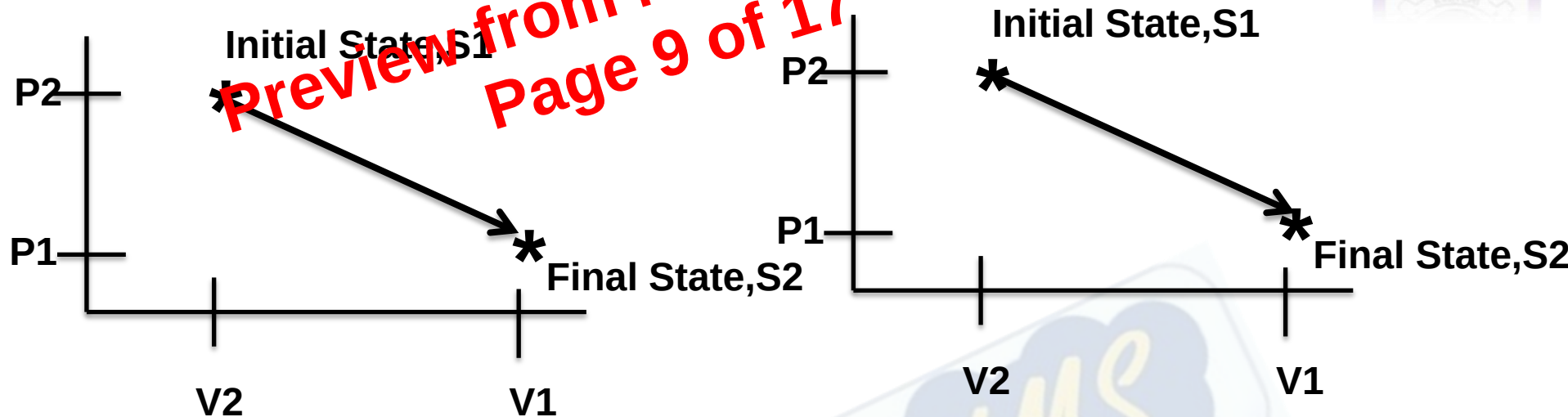
**This equation contain  $P, V, T$ . Working equations depends on which pair of these variables is selected.**





# Comparison B/W Isothermal & Adiabatic Process

$$1 \text{ g } (p_1, V_1, T_1) = 1 \text{ g } (p_2, V_2, T_1)$$



## Isothermal Expansion

## Adiabatic Expansion

- ✓ Do you think both lines on a PV diagram are represented by Same equation or different.
- ✓ Work for which process is greater.
- ✓ Why we always have one adiabatic process in each cycle or engine

