

HW 5

p 352

MC 10, 11

p 355

P 40, 53

p 457

P 24

online

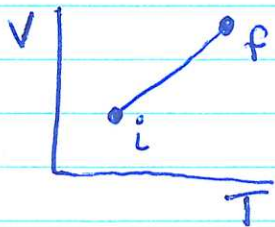
Isobaric Expansion

p 352 - Multiple Choice

10) gas sealed container, heavy top free to move, gas heated, top moves up  $V \uparrow$ , eqn describe process?

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2} \rightarrow \frac{V_1}{T_1} = \frac{V_2}{T_2}$$

11) gas sealed container w/ heavy top free to move constant external  $P$ , top moves up,  $V \uparrow$  graph?



- Problem

## - Problems

$$40) \quad P = 1 \times 10^5 \text{ N/m}^2 \\ r = .12 \text{ m}$$

Compare  $V$  at this  
w/  $V$  below 15m water  
 $P_{\text{under}} = 2.5 \times 10^5 \text{ N/m}^2$

$$P_1 V_1 = P_2 V_2 \quad V_2 = \frac{P_1 V_1}{P_2} = \frac{P_1}{P_2} \left( \frac{4}{3} \pi r^3 \right)$$

$$V_2 = \frac{(1 \times 10^5 \text{ N/m}^2)}{2.5 \times 10^5 \text{ N/m}^2} \frac{4}{3} \pi (.12 \text{ m})^3$$

$$V_2 = .002895 \text{ m}^3 \quad V_2 = 2.9 \times 10^{-3} \text{ m}^3$$

$$53) \quad \frac{1.2 \times 10^5 \text{ N/m}^2}{293 \text{ K}} = \frac{2.0 \times 10^5 \text{ N/m}^2}{T}$$

What process describes eqn?

$$\frac{P}{T} = \frac{P}{T}$$

constant volume

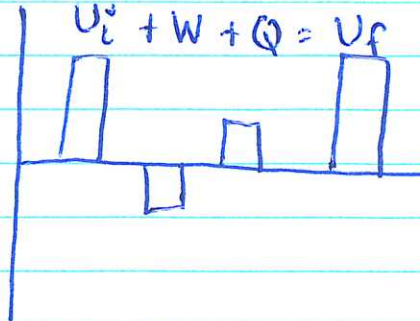


isochoric

## p 457 - Problems

24) 1st law gas is heated but temp doesn't change

a) bar chart

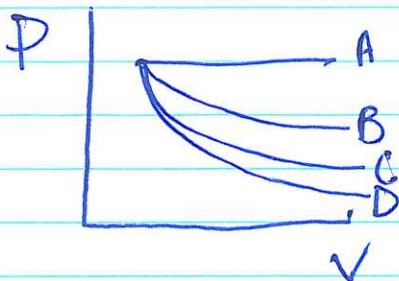


- no  $\Delta T$  so no  $\Delta U$
- heating so  $+Q$
- must be  $-W$  to balance  $Q$  for no  $\Delta U$

b) Conclusion? • Isothermal Expansion

- Online

• Isobaric expansion PV plots



a) work done along any path \_\_\_\_\_

- is the area under the curve from  $V_0$  to  $V_f$

b) Calc.  $W_A$  along path A from  $V_0$  to  $V_A = R_V V_0$

$$W = -P\Delta V = -P_0(R_V V_0 - V_0) = -P_0 V_0 (R_V - 1)$$

on gas is -  
by gas is +  
online