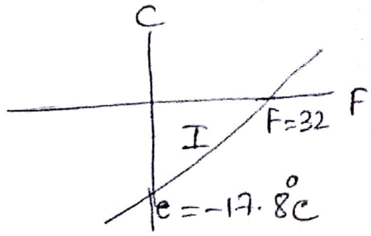
1. If that temperature is T, then from the ~~real~~ relation

$C/5 = \frac{F-32}{9}$, we get $\frac{T}{5} = \frac{T-32}{9}$

or $9T - 5T = -160$

or $T = -\frac{160}{4} = -40^\circ$ (unit can be both).

2. if $F = 32$, then $C = 0^\circ C$



if $F = 0$, then $C = -\frac{5 \times 32}{9} = -17.8^\circ C$

So "I" was the correct line.

3. $T = 100 \frac{P_T - P_0}{P_{100} - P_0} = 100 \frac{100-80}{109.3-80}$

$= \frac{20 \times 100}{29.3} = 68.26^\circ C$

4. $T_1 V_1^{\gamma-1} = T_2 V_2^{\gamma-1}$

$\therefore T_2 = T_1 \left(\frac{V_1}{V_2}\right)^{\gamma-1} = (273+20)\left(\frac{1}{1.4}\right)^{1.4-1}$

$= 256.1^\circ K = (256.1 - 273)^\circ C = -16.9^\circ C$

5. $P_1 V_1 = P_2 V_2$ "isothermal expansion",

$\therefore P_2 = P_1 \frac{V_1}{V_2} = \frac{1}{2} \times 10^6$.

$P_2 V_2^\gamma = P_3 V_3^\gamma$ "adiabatic expansion"

$\therefore P_3 = P_2 \left(\frac{V_2}{V_3}\right)^\gamma = \frac{1}{2} \times 10^6 \times \left(\frac{1}{2}\right)^{1.4}$

$= 1.895 \times 10^5$ dynes/cm^2.