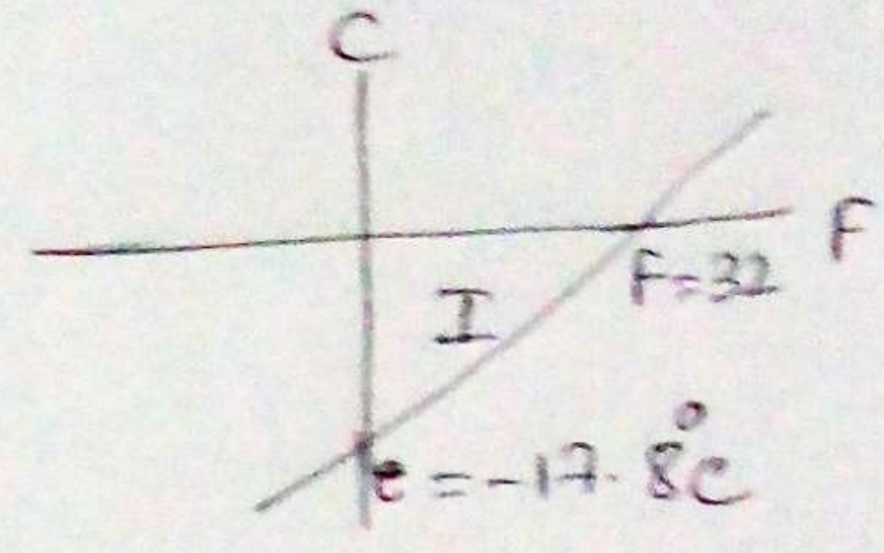
1. If that temperature is T, then from the ~~rod~~ relation

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

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"

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

$$= 1.895\times 10^5 \text{ dynes/cm}^2$$