① $a = \frac{27 R^2 T_c^2}{64 P_c}$, $R = \frac{1}{273}$ lit-atm / °

$= \frac{27}{64}\left(\frac{1}{273}\right)^2 \frac{(5.3)^2}{2.25} = 9.1 \times 10^{-5}$ atm cm^6

$b = \frac{RT_c}{8 P_c} = \frac{1}{273} \times \frac{1}{8} \times \frac{5.3}{2.25} = 1.078 \times 10^{-3}$ /cc

(2) $P_c = a/27b^2$, $T_c = \frac{8a}{27Rb}$

using VW equation $\left(P + \frac{a}{V^2}\right)(V-b) = RT$

$$\left(1 + \frac{6.15 \times 10^{-5}}{1^2}\right)\left(1 - 9.95 \times 10^{-5}\right) = R \times 273$$

$$\therefore R = \frac{9.99}{273}.$$

$$\therefore T_c = \frac{8 \times 6.15 \times 10^{-5}}{27 \times 9.95 \times 10^{-5}} \times \frac{273}{9.99} = 5K = -268^{\circ}C$$

$$P_c = \frac{6.15 \times 10^{-5}}{27 \times (9.95)^2 \times 10^{-8}} = 2.3 \text{ atm}$$