

ORIGIN := 1

T := 310

P := 1.5

$$z := \begin{pmatrix} 0.25 \\ 0.15 \\ 0.25 \\ 0.35 \end{pmatrix}$$

$$T_c := \begin{pmatrix} 369.9 \\ 425 \\ 469.8 \\ 507.6 \end{pmatrix}$$

$$P_c := \begin{pmatrix} 42.5 \\ 38 \\ 33.6 \\ 30.2 \end{pmatrix}$$

$$\omega := \begin{pmatrix} 0.153 \\ 0.199 \\ 0.251 \\ 0.299 \end{pmatrix}$$

i := 1 .. 4

$$T_{r_i} := \frac{T}{T_{c_i}}$$

$$P_{r_i} := \frac{P}{P_{c_i}}$$

$$K_i := 10 \cdot \frac{7}{3} \cdot (\omega_i + 1) \cdot \left(1 - \frac{1}{T_{r_i}} \right) - \log(P_{r_i})$$

VF := 0.5

Given

$$0 = \sum_{i=1}^4 \frac{z_i \cdot (K_i - 1)}{1 + VF \cdot (K_i - 1)}$$

VF := Find(VF) = 0.495

$$x_i := \frac{z_i}{1 + VF \cdot (K_i - 1)}$$

$$y_i := \frac{z_i \cdot K_i}{1 + VF \cdot (K_i - 1)}$$

$$x = \begin{pmatrix} 0.053 \\ 0.091 \\ 0.293 \\ 0.563 \end{pmatrix}$$

$$y = \begin{pmatrix} 0.451 \\ 0.211 \\ 0.206 \\ 0.133 \end{pmatrix}$$