

$$f(x_1) := x_1 \cdot (1 - x_1) \cdot [1.8 + 0.3(2x_1 - 1) - 0.85(2x_1 - 1)^2]$$

$$g(x_1) := \frac{1}{x_1 \cdot (1 - x_1)} + \frac{d^2}{dx_1^2} f(x_1) \text{ simplify} \rightarrow \frac{1.0}{x_1} - \frac{1.0}{x_1 - 1.0} - 44.4 \cdot x_1 + 40.8 \cdot x_1^2 + 6.7$$

$$g(x_1) \text{ collect} \rightarrow \frac{852.0 \cdot x_1^3 - 408.0 \cdot x_1^4 - 511.0 \cdot x_1^2 + 67.0 \cdot x_1 + 10.0}{10.0 \cdot x_1 - 10.0 \cdot x_1^2}$$

$$v := \begin{pmatrix} -10 \\ -67 \\ 511 \\ -852 \\ 408 \end{pmatrix}$$

$$\text{polyroots}(v) = \begin{pmatrix} -0.085 \\ 0.378 \\ 0.682 \\ 1.114 \end{pmatrix}$$

$$x_1 := 0, 0.01 .. 1$$

$$G(x_1) := x_1 \cdot \ln(x_1) + (1 - x_1) \cdot \ln(1 - x_1) + f(x_1)$$

