$$\int_0^2 \frac{\exp(3\ x)+1}{\exp(x)+1}\,dx = 22.41002$$

Начальные приближения

$a := 7$

Ограничения

$$\int_{0.1}^{a} x^{0.2}\cdot\left(ln(0.1\ x)+x\right)dx = 0$$

Решатель

$$\mathbf{find}(a) = 3.37463$$

Начальные приближения

$$X := \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

$$A := \begin{bmatrix} 6.9 & 8.3 & 3.7 & -5.5 \\ -4.1 & 6.4 & 6.5 & 1.9 \\ 6.3 & 0.9 & 2.1 & 2.2 \\ 9.6 & 9.5 & 8.8 & 2.1 \end{bmatrix} \qquad B := \begin{bmatrix} -8.1 \\ -3.9 \\ 1.4 \\ 8.9 \end{bmatrix}$$

Ограничения

$$A\cdot X = B$$

Решатель

$$\mathbf{find}(X) = \begin{bmatrix} 0.22979 \\ 22.49189 \\ -27.60828 \\ 17.13047 \end{bmatrix}$$

ния

$x := 1$

Ограничения
Начальные приближе
Решатель

$$3\ ln(x)^2 + 6\ ln(x) - 5 = 0$$

$$\mathbf{find}(\mathbf{x}) = 1.883239$$

$$M := \begin{bmatrix} 6.9 & 8.3 & 3.7 & -5.5 \\ -4.1 & 6.4 & 6.5 & 1.9 \\ 6.3 & 0.9 & 2.1 & 2.2 \\ 9.6 & 9.5 & 8.8 & 2.1 \end{bmatrix}$$

$$A := \text{eigenvals}(M) = \begin{bmatrix} 12.399 \\ 2.389 + 7.362i \\ 2.389 - 7.362i \\ 0.322 \end{bmatrix}$$

$$B := \text{eigenvec}(M, A_0) = \begin{bmatrix} 0.121 \\ 0.49 \\ 0.291 \\ 0.813 \end{bmatrix}$$

$$B := B \cdot \frac{2.07246}{B_0} = \begin{bmatrix} 2.07246 \\ 8.36321 \\ 4.96562 \\ 13.88935 \end{bmatrix}$$

$$VX := \begin{bmatrix} 3.2 \\ 4.3 \\ 5 \\ 6.7 \\ 7.5 \\ 8.2 \\ 9.1 \\ 10 \end{bmatrix} \qquad VY := \begin{bmatrix} 4.4 \\ 2.5 \\ -0.7 \\ -6.8 \\ -7.6 \\ -3.3 \\ 6.5 \\ 8.5 \end{bmatrix}$$

$$k := 4, 4.5 .. 9$$

$$\text{interp}(\text{cspline}(VX, VY), VX, VY, k) = \begin{bmatrix} 3.613 \\ 1.627 \\ -0.7 \\ -2.815 \\ -4.643 \\ -6.226 \\ -7.542 \\ -7.6 \\ -5.042 \\ -0.097 \\ 5.521 \end{bmatrix}$$

$$VX := \begin{bmatrix} 1.2 \\ 1.8 \\ 2.6 \\ 3.1 \\ 3.6 \\ 4.5 \\ 5.6 \\ 6.2 \end{bmatrix} \qquad VY := \begin{bmatrix} 6.5 \\ -3.1 \\ 0.1 \\ 1.7 \\ -4.1 \\ 0.2 \\ 8.7 \\ 7.3 \end{bmatrix}$$

$$k := 2, 2.2 .. 6$$

$$\text{interp}\left(\text{lspline}\left(VX, VY\right), VX, VY, k\right) = \begin{bmatrix} -3.725 \\ -3.071 \\ -1.632 \\ 0.1 \\ 1.582 \\ 2.073 \\ 0.832 \\ -1.74 \\ -4.1 \\ -4.989 \\ -4.483 \\ -2.992 \\ -0.923 \\ 1.32 \\ 3.471 \\ 5.405 \\ 7.001 \\ 8.139 \\ 8.7 \\ 8.621 \\ 8.077 \end{bmatrix}$$

$$VX := \begin{bmatrix} 1.5 \\ 2.1 \\ 2.9 \\ 3.1 \\ 3.4 \\ 3.8 \\ 4.6 \\ 5.2 \end{bmatrix} \qquad VY := \begin{bmatrix} 2.4 \\ 5 \\ 6.9 \\ 4.7 \\ 2.5 \\ -3.9 \\ -1.4 \\ 0.6 \end{bmatrix}$$

$$i := 0, 1 .. 7$$

$$\text{interp}\left(\text{regress}\left(VX, VY, 3\right), VX, VY, VX_i\right) = \begin{bmatrix} 1.863 \\ 6.717 \\ 5.133 \\ 3.926 \\ 1.888 \\ -0.757 \\ -2.977 \\ 1.007 \end{bmatrix}$$

Начальные приближения

$F(x,y) := 1 + \exp(x) - y \qquad a := 0 \qquad b := 1 \qquad dx := 0.05$

$y_0 := 2.5 \qquad x_0 := 0$

Ограничения

$$n := \frac{b-a}{dx}$$

Решатель

$$\text{solution} := \text{rkfixed}(y, a, b, n, F)$$

$$\text{solution} = \begin{bmatrix} 0 & 2.5 \\ 0.05 & 2.477 \\ 0.1 & 2.457 \\ 0.15 & 2.442 \\ 0.2 & 2.429 \\ 0.25 & 2.421 \\ 0.3 & 2.416 \\ 0.35 & 2.414 \\ 0.4 & 2.416 \\ 0.45 & 2.422 \\ 0.5 & 2.431 \\ 0.55 & 2.444 \\ 0.6 & 2.46 \\ 0.65 & 2.48 \\ 0.7 & 2.503 \\ 0.75 & 2.531 \\ 0.8 & 2.562 \\ 0.85 & 2.597 \\ 0.9 & 2.636 \\ 0.95 & 2.68 \\ 1 & 2.727 \end{bmatrix}$$

вльные приближения

$F(x,y) := 1.72\ x^2 + 1.07\ y^2 + \sin\left(0.48\ (x+0.8)^2 + 0.85\ (y+0.3)^2 - 1.7 + \exp(0\right.$

$x := 2 \qquad y := 0$

$$\text{minimize}\left(F, x, \mathbf{y}\right) = \begin{bmatrix} -0.14927 \\ -0.1161 \end{bmatrix}$$

$$F(x, y) := 17\ x + 0.1\ y + \exp\left(2.56\ x^2 + 0.27\ y^2\right)$$

$$x := 0 \qquad y := 1$$

$$\mathbf{a} := \text{minimize}\left(F, x, \mathbf{y}\right) = \begin{bmatrix} -0.759 \\ -0.042 \end{bmatrix}$$

$$F\left(\mathbf{a}_0, \mathbf{a}_1\right) = -8.535$$