$$-\frac{\mathbf{d}^2 y_n}{\mathbf{d}\boldsymbol{x}^2} + \boldsymbol{x} y_n = \lambda_n y_n$$

on $0 \leqslant x \leqslant \infty$, with $y(0) = y(\infty) = 0$.

To this equation the solution is:

$$y_n = C_1 \mathrm{Ai}(x + \lambda_n)$$

Where C_1 is an arbitrary constant, and λ_n are the zeros of the Airy function, $\mathrm{Ai}(x)$, on the negative x axis (e.g. $\lambda_1 \approx -2.338$).

To numerically integrate this solution let us use a Chebyshev spectral method. If t_m comprises points on the Chebyshev extrema grid, that is:

$$t_m = -\cos\left(\frac{\pi m}{N}\right), \qquad n \in [0, 1, 2, \ldots, N]$$

then:

$$x_m = L\left(\frac{1 + t_m}{1 - t_m}\right)$$

This is a rational transformation from the Chebyshev extrema grid to the semi-infinite domain.