1D Burger's Equation.

$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} - \nu\frac{\partial^2 u}{dx^2} = 0$$

Solution: $$u(0) = -2\nu\,\frac{\partial\phi}{\partial x}\Big/\phi + 4$$

with $$\phi = e^{-x^2/4\nu} + e^{-\frac{(x-2\pi)}{4\nu}}$$

$$\frac{\partial\phi}{\partial x} = e^{-x^2/4\nu}\left(-\frac{2x}{4\nu}\right) + e^{-\frac{(x-2\pi)^2}{4\nu}}\left(-\frac{2(x-2\pi}{4\nu}\right.$$

$$\frac{-2\nu\frac{\partial\phi}{\partial x}}{\phi} = \frac{e^{-x^2/4\nu}(x) + e^{-(x-2\pi)^2/4\nu}(x-}{e^{-x^2/4\nu} + e^{-(x-2\pi)^2/}}$$

$$u(0) = \frac{x e^{-x^2/4\nu} + (x-2\pi)e^{-\frac{(x-2\pi}{4\nu}}}{e^{-x^2/4\nu} + e^{-\frac{(x-2\pi)^2}{4\nu}}}$$

+ 4