$$\frac{\partial y}{\partial t} = 2\frac{Q}{A}\sin^2(t) - \frac{\alpha(1+y)^{3/2}}{A}$$

Euler's $\quad y_{i+1} = y_i + \left(2\frac{Q}{A}\sin^2(t_i) - \frac{\alpha(1+y_i)^{3/2}}{A}\right)h$

a) @ $t=0 \quad y = 2m$

(cnst) $\begin{cases} A = 850\ m^2 \\ Q = 325\ m^3/s \\ \alpha = 200\ m^{3/2}/s \end{cases}$

$$y_{0.5} = 2 + \left(2\left(\frac{325}{200}\right)\sin^2(0) - \frac{200(1+2)^{3/2}}{850}\right)(0.5)$$

$$y_{0.5} = 1.388688\ m$$

$$y_1 = y_{.5} + \left(2\frac{(325)}{200}\sin^2(0.5) - \frac{200(1+y_{.5})^{3/2}}{850}\right)h$$

$$y_1 = 1.042241\ m$$

$$y_{1.5} = y_1 + \left(2\frac{325}{200}\sin^2(0.5) - \frac{200(1+y_1)^{3/2}}{850}\right)h$$

$$y_{1.5} = 0.9696214\ m$$

d) Dependent variables:
- water level

Independent variables:
- time

System parameters:
- cross section A
- Q - flow constant
- α - system constant