$$\frac{d^2x}{dt^2} = -\frac{C}{x^2}$$

$$\frac{dv}{dt} = -\frac{K}{x^2}$$

$$\frac{dx}{dt} = v$$

$$\text{flow in from left} = f(x_i)\ dy\ dz$$

$$\text{flow out to right} = f(x_{i+1})\ dy\ dz$$

$$f(x_{i+1})\ dy\ dz = f(x_i)\ dy\ dz$$

$$\Delta x \equiv x_{i+1} - x_i$$

$$f(x + \Delta x) = f(x)$$

$$\frac{\partial f}{\partial x} = 0$$

$$\frac{\partial f}{\partial y} = 0$$

$$f(x) = C \qquad \text{(some constant value)}$$

$$\frac{\partial q}{\partial x} + \frac{\partial q}{\partial y} = 0$$

$$q = -k\frac{\partial T}{\partial x}$$

$$\frac{\partial^2 T}{\partial x^2} = 0$$

$$\frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} = 0$$

$$\frac{\partial^2 T}{\partial x^2} = S(x)$$

$$\text{forward difference } D_i^+ = \frac{T_{i+1} - T_i}{x_{i+1} - x_i}$$

$$\text{backward difference } D_i^- = \frac{T_i - T_{i-1}}{x_i - x_{i-1}}$$

$$\text{centered second difference } D_i^2 = \frac{D_i^+ - D_i^-}{\frac{1}{2}(x_{i+1} - x_{i-1})}$$

$$T_{\text{new}} = (1 - \lambda) T_{\text{old}} + \lambda T_{\text{predicted}}$$