$$y'(t) \quad = \quad f(t) \qquad \text{(but not a function of y)}$$

$$y'(t) \quad = \quad -(9.8\frac{m}{s^2})\,t \,+ v_0$$

$$y_{i+1} \quad = \quad y_i \;+\; y'_i\,dt$$

$$y_{i+1} \quad = \quad y_i \;+\; \frac{1}{2}(y'_i + y'_{i+1})\,dt$$

$$y_{i+1} \quad = \quad y_i \;+\; \frac{(y'_i \;+\; 4y'_{i+1/2} \;+\; y'_{i+1})}{6}\,dt$$