Week 2 summary:

- **Euler's method:** $y' = f(t, y)$, $\quad y(t_0) = y_0$, $\quad$ step-size h.
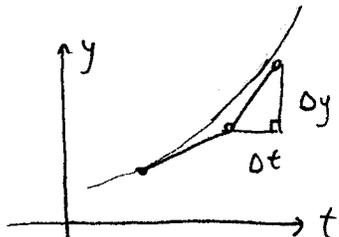
$\quad$ Method: $(t_{k+1}, y_{k+1}) = \big(t_k + h, \; y_k + \underbrace{h \cdot f(t_k, y_k)}_{\Delta y}\big)$

$\qquad\qquad\qquad\qquad\qquad\;\; \uparrow$
$\qquad\qquad\qquad\qquad\qquad \Delta t$

- Solving ODE's by <u>separation of variables</u>.

- Difference between the general <u>solution</u> and a <u>particular solution</u>, given initial conditions.

- Another situation modeled by decay $\rightarrow$ value ODE: Falling objects with air resistance.

- <u>Linear ODE's</u>: $\quad y'(t) = a(t)\, y(t) + f(t)$.

  <u>Homogeneous</u> if $y'(t) = a(t)\, y(t)$.