$\frac{1}{c}$ Runge-Kutta Method (one-step)

! order 4

$f(y) = 2y(t) = 2e^{t}$

$$\mu_{n+1} = \mu_n + \frac{h}{6}(k_1 + 2k_2 + 2k_3 + k_4)$$

$k = ?$

$k_1 = \ldots$

2

$3 \quad \ldots$

4

$\rightarrow k_1 = f(\mu_n) = \quad \ldots$

$k_2 = f(\mu_n + \frac{h}{2} k_1) =$

$k_3 = f(\mu_n + \frac{h}{2} k_2) =$

$k_4 = f(\mu_n + hk_3) =$

$$\mu_1 = \mu_0 + \frac{h}{6}\Big(\underbrace{f(\mu_0)}_{k_1} + \cdots$$

$$\cdots + 2\cdot\Big(\underbrace{f(\mu_0 + \tfrac{h}{2}f(\mu_0))}_{k_2}\Big) + \cdots$$

$$\cdots + 2\underbrace{\Big(f(\mu_0 + \tfrac{h}{2}(f(\mu_0 + \tfrac{h}{2}f(\mu_0))))\Big)}_{k_3}$$

$$\cdots + \underbrace{f(\mu_0 + h\underbrace{((f(\mu_0 + \tfrac{h}{2}(f(\mu_0 + \tfrac{h}{2}f(\mu_0))))))}_{k_3}}_{k_4}$$