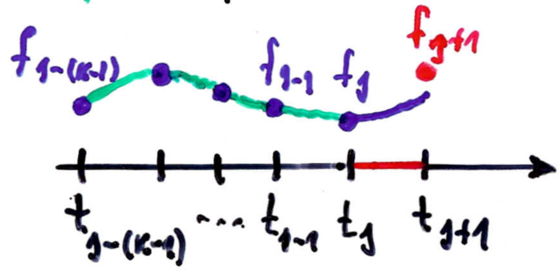
5.5.1. Adams-Bashforth-Formeln

- <u>Ausgangspkt</u> = ②
- <u>Idee:</u> $u(t_{j+1}) = u(t_j) + \int_{t_j}^{t_{j+1}} \underbrace{f(t,u(t))}\, dt$

$p \in P_{k-1}$



Extrapolationsquadratur:
- Stützstellen: t_i
- Stützwerte: $f_i = f(t_i, u_i)$

$\underbrace{i = j-(k-1), \ldots, j-1, j}_{k \text{ Werte}}$

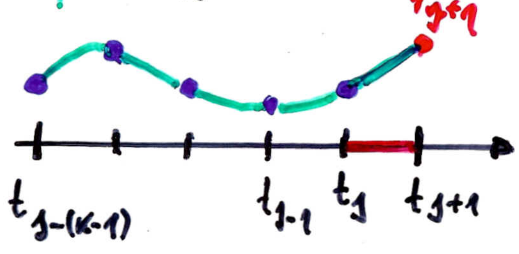
$$u_{j+1} = u_j + \tau \int_0^1 p(t_j + s\tau)\, ds$$

- <u>Bem.:</u> 1. Adams-Bashforth-Formeln sind <u>explizite</u> MSV.
  2. KO = k, 0-stabil
  3. $k=1$: $u_{j+1} = u_j + \tau f_j$, $k=2$: $u_{j+1} = u_j + \tau\left[\frac{3}{2} f_j - \frac{1}{2} f_{j-1}\right]$, ...

5.5.2. Adams-Moulton-Formeln

- <u>Ausgangspkt</u> = ②
- <u>Idee:</u> $u(t_{j+1}) = u(t_j) + \int_{t_j}^{t_{j+1}} \underbrace{f(t,u(t))}\, dt$

$p^* \in P_k$



Interpolationsquadratur:
- Stützstellen: t_i
- Stützwerte: $f_i = f(t_i, u_i)$

$\underbrace{i = j-(k-1), \ldots, j, j+1}_{(k+1) \text{ Werte}}$

$$u_{j+1} = u_j + \tau \int_0^1 p^*(t_j + s\tau)\, ds$$

- <u>Bem.:</u> 1. Adams-Moulton-Formeln sind <u>implizite</u> MSV.
  2. KO = k+1, 0-stabil
  3. $k=0$: $u_{j+1} = u_j + \tau f_{j+1}$ ↝ impliziter Euler
     $k=1$: $u_{j+1} = u_j + \tau\left[\frac{1}{2} f_j + \frac{1}{2} f_{j+1}\right]$ ↝ CRANK-NICOLSON