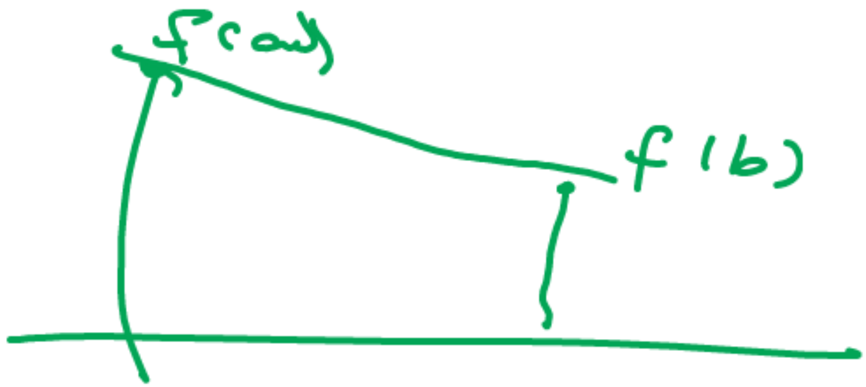

$$f(x) \sim P(x)$$

$$\int_a^b f(x)\,dx \sim \int_a^b P(x)\,dx$$

$$= \frac{1}{2}\left(f(a) + f(b)\right)$$

$f(t) \quad t \in (0,1)$

$$\int_0^1 f(t)\,dt$$

Interpolate F $\quad x_0 = 0 \quad x_1 = 1$

$f(0) \quad f(1) \quad f'(0) \quad f'(1)$

$p(t) \ni p(0) = f(0) \quad p(1) = f(1)$

$p'(0) = f'(0) \quad p'(1) = f'(1)$

$$p(t) = l_{00}(t) f(0) + l_{11}(t) f(1) +$$
$$+ l_{01}(t) f'(0) + l_{10}(t) f'(1)$$

$f(t) \quad t \in (0,1)$

$$\int_0^1 f(t)\,dt$$

Interpolate F $x_0 = 0$ $x_1 = 1$

$f(0)$ $f(1)$ $f'(0)$ $f'(1)$

$p(t) \ni p(0) = f(0)$ $p(1) = f(1)$

$p'(0) = f'(0)$ $p'(1) = f'(1)$

$$p(t) = l_{00}(t) f(0) + l_{11}(t) f(1) +$$

$$+ l_{01}(t) f'(0) + l_{10}(t) f'(1)$$

$l_{00}(0) = 1$ $l_{00}(1) = 0$

$l'_{00}(0) = 0$ $l'_{00}(1) = 0$

$f(t) \qquad t \in (0,1)$

$$\int_0^1 f(t)\,dt \approx \int_0^1 p(t)\,dt =$$

Interpolate F $\quad x_0 = 0 \quad x_1 = 1$

$f(0) \quad f(1) \quad f'(0) \quad f'(1)$

$p(t) \ni \quad p(0) = f(0) \quad p(1) = f(1)$

$p'(0) = f'(0) \quad p'(1) = f'(1)$

$$p(t) = l_{00}(t) f(0) + l_{11}(t) f(1) +$$
$$+ l_{01}(t) f'(0) + l_{10}(t) f'(1)$$

$l_{00}(0) = 1 \qquad l_{00}(\phi) = 0$

$l_{00}'(0) = 0 \quad l_{00}'(1) = 0$

$$\int_a^b uv' = uv\Big|_a^b - \int_a^b u'v$$

$v' \longrightarrow v$

$v' \longrightarrow v + k$

$$u(v+k)\Big|_a^b - \int_a^b u'(v+k)\,dx$$

$$uv\Big|_a^b + uk\Big|_a^b - \int_a^b u'v\,dx$$

$$-\int_a^b u'k$$

$$B'_{n+1}(t) = n \; B_n(t)$$

$$\psi_n(s) = (-1)^n B_n(1-s) = B_n(s)$$

$$\psi_{n+1}(s) = (-1)^{n+1} B_{n+1}(1-s)$$

$$\underline{\psi'_{n+1}(s)} = -(-1)^{n+1} B'_{n+1}(1-s)$$

$$= (-1)^n \, n \, B_n(1-s) = \underline{n \, \psi_n(s)}$$