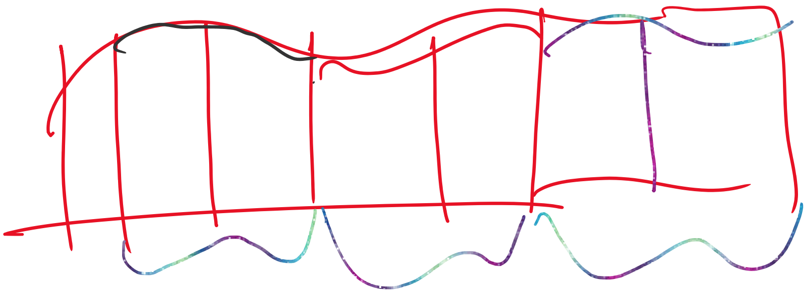
$$\int_a^b f(x)\,dx = \frac{h}{3}\Big[\{f(x_0) + 4f(x_1) + f(x_2)\}$$
$$+ \{f(x_2) + 4f(x_3)$$



$$\cdots\cdots + \{f(x_{2n-2}) +$$
$$+$$

$$= \frac{h}{3}\Big[f(x_0) + 4\{f(x_1) + f(x_3) + \cdots +$$
$$+ 2\{f(x_2) + f(x_4) + f(x_6) + \cdots$$
$$+ f(x_{2n})\Big]$$

$$= \frac{h}{3}\Big[\underline{f(a) + f(b)} + 4\Big\{\begin{matrix}\text{fun at}\\ \text{odd}\\ \text{point}\end{matrix}\Big\} + 2$$

$$R(f,x) = -\frac{h^5}{90}\Big[f^{(iv)}(\xi_1) + f^{(iv)}(\xi_2) + \cdots$$

$$|R(f,x)| \le \frac{h^5 n}{90} \max_{x \in [a,b]} |f^{(iv)}(x)|$$

$+ f(x_4) \}$

$4f(x_{2n-1})$

$f(x_{2n}) \}]$

$f(x_{2n-1}) \}$

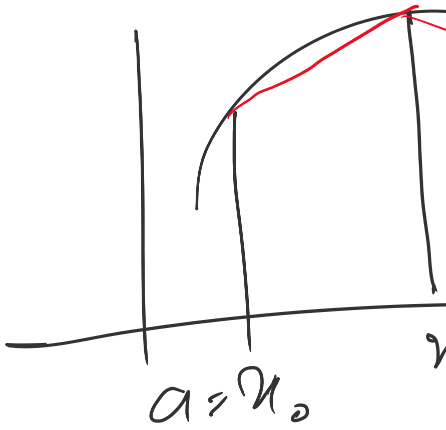
$+ f(x_{2n-2})$

$\{$ fun at even pts $\}]$

$f^{(IV)}(\xi_{2n})]$

$$|K(f,n)| \le \frac{\cdots}{90} \max_{x\in[a,b]} |f^{(iv)}(x)|$$

$$= \frac{(b-a)^5}{2880\, n^4} \max_{x\in[a,b]} |f^{(iv)}(x)|$$



In the method $f(x)$ is approximated by a cubic polynomial.

$x_0 = a$

$x_1 = x_0 + h$

$x_2 = x_0 + 2h$

$x_3 = x_0 + 3h$

$h = \frac{b-a}{3}$

$P(x_0, f(x_0))$, $Q(x_1, f(x_1))$, $R(x_2, f(x_2))$, $S(x_3, f(x_3))$

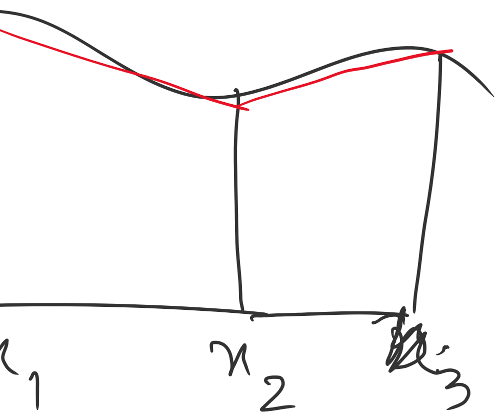
$$f(x) = f(x_0) + \frac{x-x_0}{h}\Delta f(x_0) + \frac{(x-x_0)(x-x_1)}{2h^2}\Delta^2 \ldots$$

$$+ \frac{1}{6h^3}(x-x_0)(x-x_1)(x-x_2)\Delta^3 f(x_0)$$

$$\int_a^b f(x)\,dx = \int_{x_0}^{x_3} f(x)\,dx = \int_{x_0}^{x_3}\left[f(x_0) + \frac{x-x_0}{h}\Delta f(x_0)\right.$$

$$= \frac{3h}{8}\left[f(x_0) + 3f(x_1) + 3f(x_2) + f \ldots\right.$$

$$R(f,n) = -\frac{(b-a)^5}{\cdots} f^{(iv)}(\xi), \quad a \le \xi \le b$$



$f(x_0)$

$]dx$

$f(x_3)]$

$$R(f,x) = -\frac{(b-a)^5}{6480} f^{(iv)}(\xi), \quad a \le \xi \le b$$

$$= -\frac{3h^5}{80} f^{(iv)}(\xi) \quad \left[h = \frac{b-a}{3}\right]$$

Composite formula for Simpson's 3/8

$$\int_a^b f(x)\,dx = \int_{x_0}^{x_{3k}} f(x)\,dx$$

$$= \int_{x_0}^{x_3} f(x)\,dx + \int_{x_3}^{x_6} f(x)\,dx + \cdots + \int_{x_{3}}$$

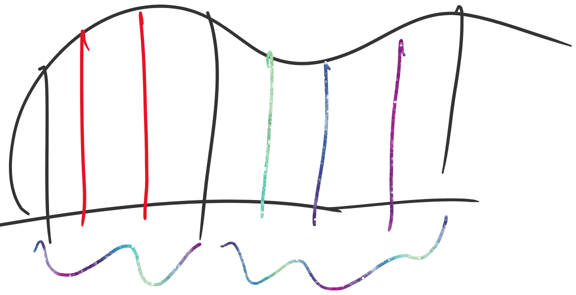
$$= \frac{3h}{8}\Big[f(x_0) + f(x_{3k}) + 3\{f(x_1) + f(x_2) + f(x_4)$$

$$+ 2\{f(x_3) + f(x_6) + f(x_9) +$$

$$|R(f,x)| \le \frac{3kh^5}{90} \max_{a \le x \le b} |f^{(iv)}(x)|$$

$$\int$$

$$\int\int f(x)\,dx\,dy$$

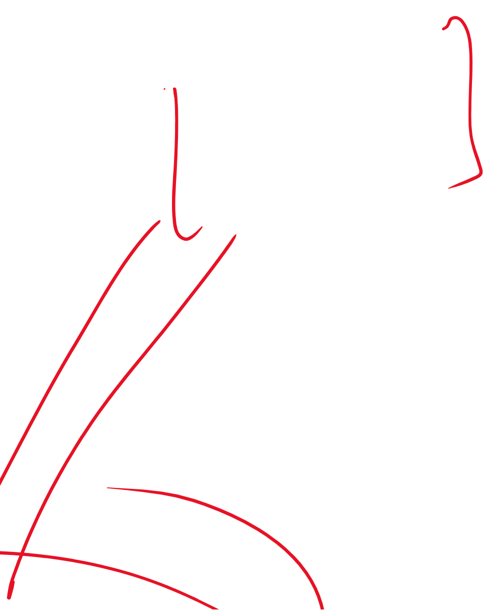


$$\int^{x_{3n}} f(x)\,dx$$

$n-3$

$+ \cdots \}$

$\cdots + f(x_{3k-3}) \}]$



$$\int I_1 \, dy \qquad I_1 = \int f(\ldots$$

x	y
1	100
2	50
3	25
4	5.5
5	20

$f(4.1) =$

$f(4.9) =$

$f(3.5) =$

$f(2.8) =$