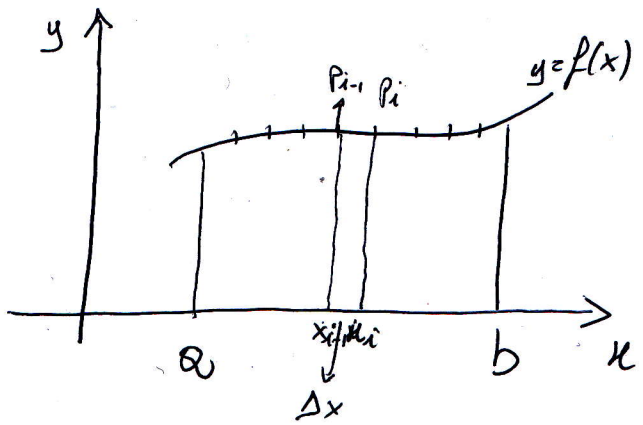
LUNGHEZZA ARCO DI CURVA



$$\Delta x = \frac{b-a}{n}$$

$$L = \lim_{n\to\infty} \sum_{i=1}^{n} \overline{P_{i-1}P_i} = \lim_{n\to\infty} \sum_{i=1}^{n} \sqrt{(x_i - x_{i-1})^2 + (f(x_i) - f(x_{i-1}))^2}$$

siccome $y=f(x)$ è derivabile in $[a,b]$ allora $\forall$ intervallo

$f(x_i) - f(x_{i-1}) = f'(c_i)(x_i - x_{i-1})$ quindi

$$L = \lim_{n\to\infty} \sum_{i=1}^{n} \sqrt{(x_i - x_{i-1})^2 + f'(c_i)^2 (x_i - x_{i-1})^2} =$$

$$= \lim_{n\to\infty} \sum_{i=1}^{n} \sqrt{(x_i - x_{i-1})^2 \left[1 + f'(c_i)^2\right]} =$$

$$= \lim_{n\to\infty} \sum_{i=1}^{n} (x_i - x_{i-1}) \sqrt{1 + f'(c_i)^2} =$$

$$= \lim_{n\to\infty} \sum_{i=1}^{n} \sqrt{1 + f'(c_i)^2}\, \Delta x = \int_a^b \sqrt{1 + f'(x)^2}\, dx$$