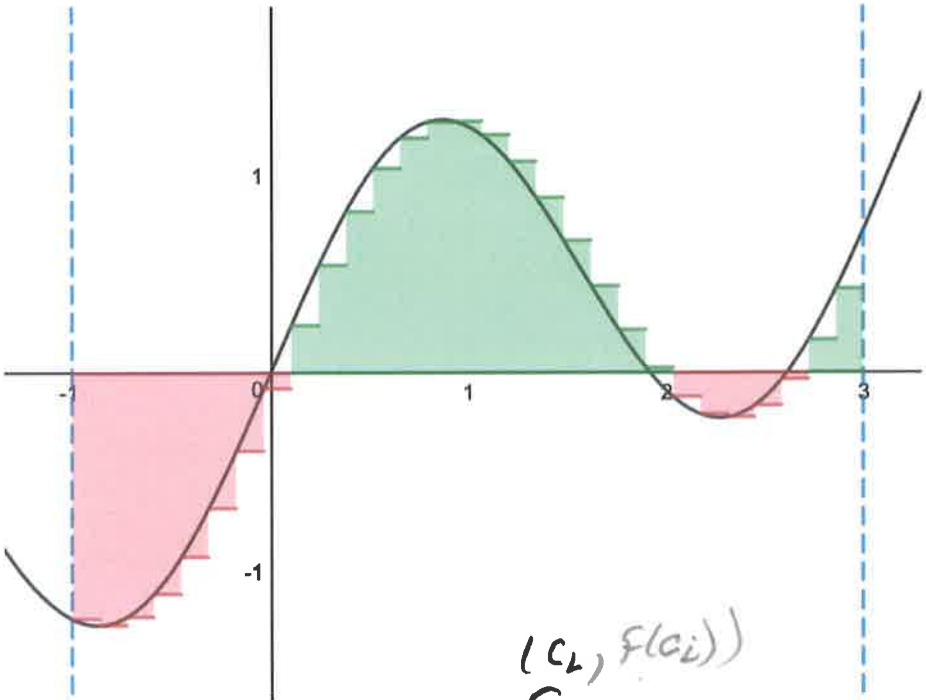
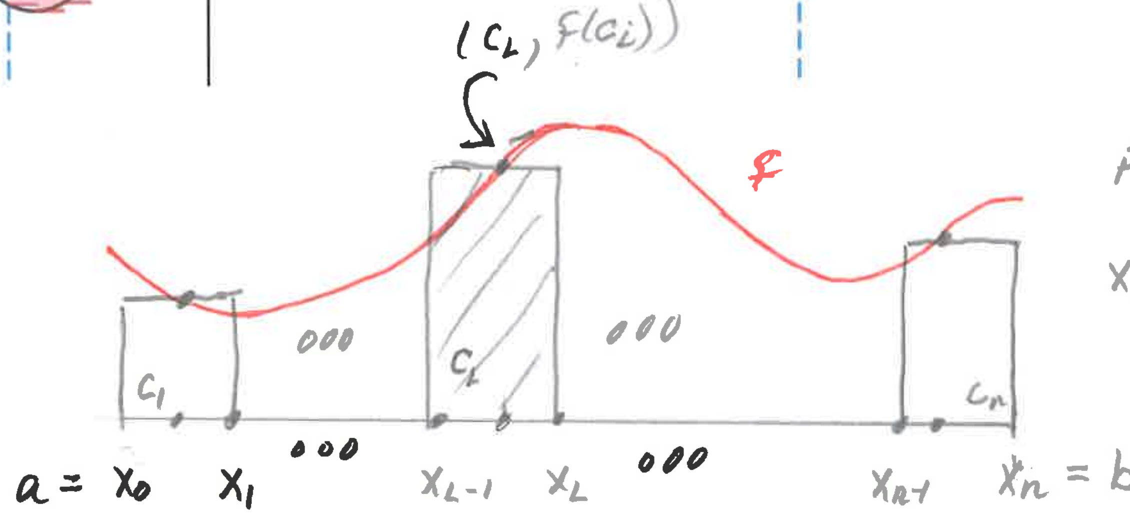
Definition:





For each i

$x_i - x_{i-1}$
$= \Delta$
$= \frac{b-a}{n}$

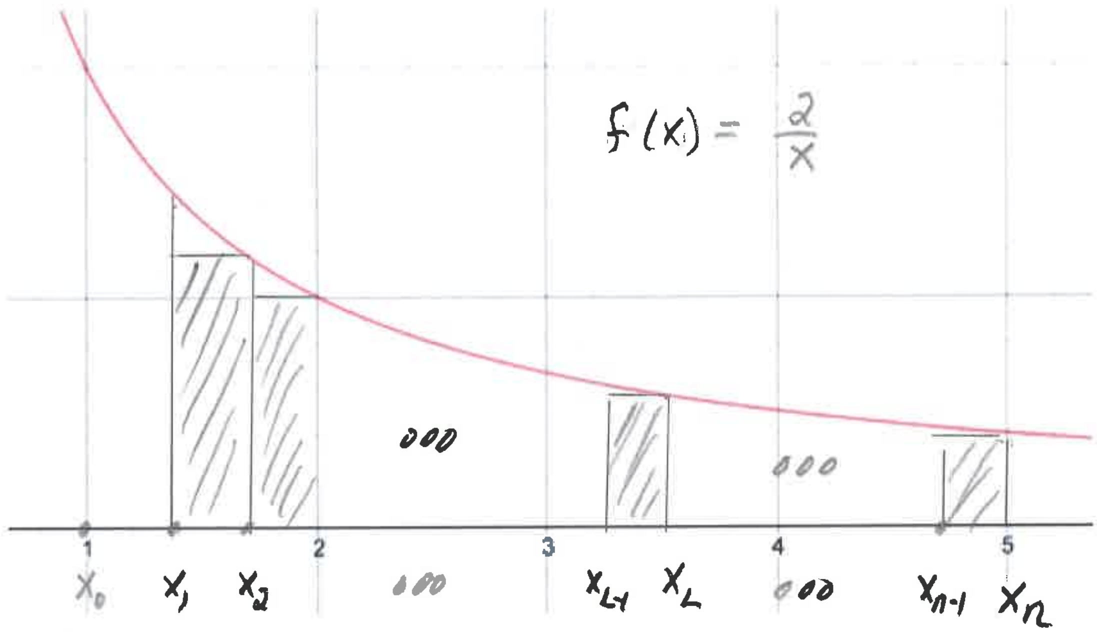
Given a function f on an interval $[a,b]$, let $\Delta x = (b-a)/n$ and let $[a,b]$ be divided into n subintervals of equal width, $[x_0,x_1],[x_1,x_2],\ldots,[x_{n-1},x_n]$, and for each i choose c_i from $[x_{i-1},x_i]$.

Then the (Riemann) integral of   from   to   is denoted by $\int_a^b f(x)dx$

and is defined to be $\lim_{n\to\infty} \sum_{i=1}^{n} f(c_i)\Delta x$ provided that the limit exists

and is the same for any choice of the points c_i.

Express $\int_1^5 \frac{2}{x}\,dx$ as a limit of a right Riemann sum.



$$\Delta x = \frac{5-1}{n} = \frac{4}{n}$$

$$x_0 = 1,\ x_1 = 1+\frac{4}{n},\ x_2 = 1+2\left(\frac{4}{n}\right),\ \ldots,$$

$$x_i = 1+i\left(\frac{4}{n}\right),\ \ldots,\ x_n = 1+n\left(\frac{4}{n}\right) = 5$$

$c_i = x_i$ for $i = 1, \ldots, n$

(the right endpoint of $[x_{i-1}, x_i]$)

$$\sum_{i=1}^{n} f(c_i)\,\Delta x = \sum_{i=1}^{n} \frac{2}{1+i\left(\frac{4}{n}\right)}\cdot\frac{4}{n}$$