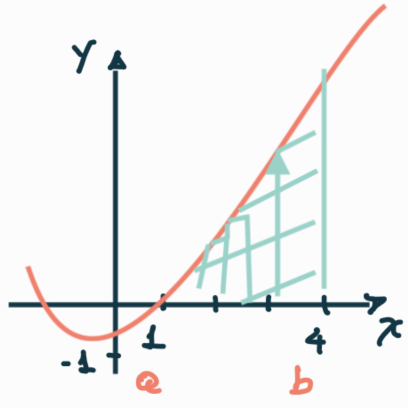
$f(x) = x^2 - 1 \quad [1, 4]$ en x

$$A = \lim_{n\to\infty} \sum_{i=1}^{n} \left(\frac{b-a}{n}\right) f(a + (i-1)\Delta x$$



$$\Delta x = \frac{b-a}{n} = \frac{4-1}{n} = \frac{3}{n}$$

$$a + (i-1)\Delta x = 1 + (i-1)\frac{3}{n} = \boxed{\frac{3i}{n} - \frac{3}{n} + 1}$$

Sost. $x^2 - 1$ $\quad x$

$$f(a + (i-1)\Delta x = \left(\frac{3i}{n} - \frac{3}{n} + 1\right)^2 - 1$$

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc$$

$$\frac{9i^2}{n^2} + \frac{9}{n^2} + 1 - \frac{18i}{n^2} - \frac{6}{n} + \frac{6i}{n} - 1$$

$$\frac{9i^2}{n^2} + \left(\frac{6i}{n} - \frac{18i}{n^2}\right) + \left(\frac{9}{n^2} - \frac{6}{n}\right)$$

$$\frac{9i^2}{n^2} + i\left(\frac{6}{n} - \frac{18}{n^2}\right) + \left(\frac{9}{n^2} - \frac{6}{n}\right)$$

Sost. en la formula.

$$A = \lim_{n\to\infty} \sum_{i=1}^{n} \left(\frac{b-a}{n}\right) f(a + (i-1)\Delta x$$

$$A = \lim_{n\to\infty} \sum_{i=1}^{n} \frac{3}{n} \cdot \left[\frac{9i^2}{n^2} + i\left(\frac{6}{n} - \frac{18}{n^2}\right) + \left(\frac{9}{n^2} - \frac{6}{n}\right)\right]$$

$$A = \lim_{n\to\infty} \sum_{i=1}^{n} \frac{27i^2}{n^3} + i\left(\frac{18}{n^2} - \frac{54}{n^3}\right) + \left(\frac{27}{n^3} - \frac{18}{n^2}\right)$$

$$\sum_{i=1}^{n} K = Kn \qquad \sum_{i=1}^{n} i = \frac{n(n+1)}{2} \qquad \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} = \frac{2n^3 + 3n^2 + n}{6}$$

$$A = \lim_{n\to\infty} \sum_{i=1}^{n} \frac{27i^2}{n^3} + \sum_{i=1}^{n} i\left(\frac{18}{n^2} - \frac{54}{n^3}\right) + \sum_{i=1}^{n} \left(\frac{27}{n^3} - \frac{18}{n^2}\right)$$

$$A = \lim_{n\to\infty} \left[\frac{27}{n^3} \sum_{i=1}^{n} i^2 + \left(\frac{18}{n^2} - \frac{54}{n^3}\right) \sum_{i=1}^{n} i + \left(\frac{27}{n^3} - \frac{18}{n^2}\right) \underbrace{\sum_{i=1}^{n} 1}_{\to n}\right]$$

$$A = \lim_{n\to\infty}\left[\frac{\overset{9}{\cancel{27}}}{n^3}\cdot\frac{2n^3+3n^2+n}{\underset{2}{\cancel{6}}} + \left(\frac{18}{n^2}-\frac{54}{n^3}\right)\frac{n^2+n}{2} + n\left(\frac{27}{n^3}-\frac{18}{n^2}\right)\right]$$

$$= \frac{18n^3+27n^2+9n}{2n^3} + \frac{18n^2+18n}{2n^2} - \frac{54n^2+54n}{2n^3} + \frac{27n}{n^3} - \frac{18n}{n^2}$$

$$= 9 + \cancel{\frac{27}{2n}} + \frac{9}{2n^2} + 9 + \frac{9}{n} - \cancel{\frac{27}{n}} - \cancel{\frac{27}{n^2}} + \cancel{\frac{27}{n^2}} - \frac{18}{n}$$

$$A = \lim_{n\to\infty}\left[18 - \frac{45}{2n} + \frac{9}{2n^2}\right]$$

$$A = 18\ u$$