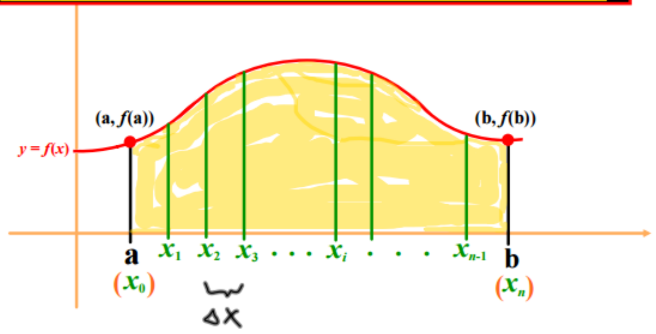
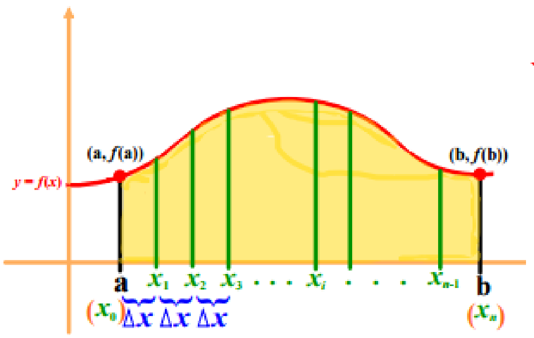
subdivide $[a, b]$ into n subintervals



$$\text{width} = \Delta x = \frac{\text{total length}}{\#\text{ rectangles}} = \frac{b - a}{n}$$

A=bh



$h = f(x_n)$

Notice:

$x_0 = a$

$x_1 = a + 1 \cdot \Delta x$

$x_2 = a + 2 \cdot \Delta x$

$x_3 = a + 3 \cdot \Delta x$

$\vdots$

$x_i = a + i \cdot \Delta x$

$\vdots$

$x_n = a + n \cdot \Delta x = b$

A=bh

Stand and Deliver

4.2

Summation Formulas

1. $\sum_{i=1}^{n} c = cn$
2. $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$
3. $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$
4. $\sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4}$

Stand and Deliver

4.2

Area Using Limits/Limit Definition to find Area

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

where $\Delta x = \frac{b-a}{n}$ and $c_i = a + (\Delta x)i$

THEOREM 4.2 SUMMATION FORMULAS

1. $\sum_{i=1}^{n} c = cn$
2. $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$
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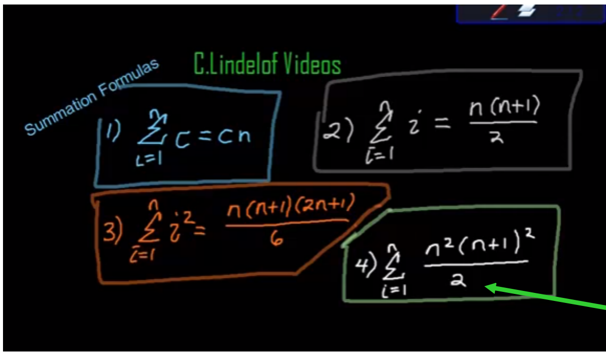
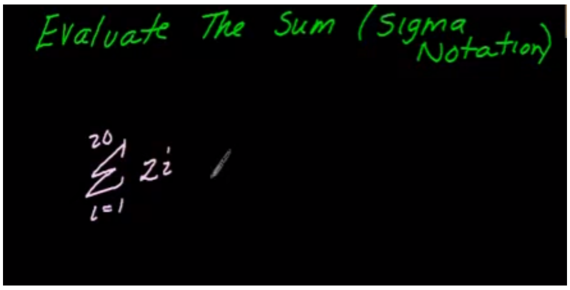


https://www.youtube.com/watch?v=XbtuWc-FSTc

(6:41)

typo, should be 4



I (letter I)

https://www.youtube.com/watch?v=PQQJERQRn1I

(10:20)

Use the limit definition of Area to estimate the area of...

$f(x) = 4 - (x)^2, \quad between \quad x = 1 \quad \& \quad x = 2$

$a = 1$, $b = 2$

$\Delta x = \frac{b-a}{n} = \frac{2-1}{n} = \frac{1}{n}$

$c_i = a + \Delta x\, i$

$c_i = 1 + \frac{1}{n} i$

$\lim_{n\to\infty} \sum_{i=1}^{n} f(c_i)\,\Delta x$

$\lim_{n\to\infty} \sum_{i=1}^{n} \left(4 - \left(1 + \frac{1}{n} i\right)^2\right) \cdot \frac{1}{n}$

to be continued ...

will

Attachments

Riemann.gsp