5.1 examples

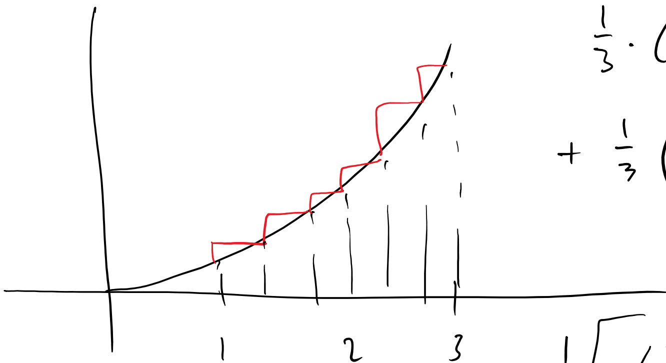
Thursday, November 15, 2018 9:35 AM

5.1 examples

Calculus AB, section 5.1 (Approximating and Computing Area)

Example 1 – Computing Right-Endpoint Approximations

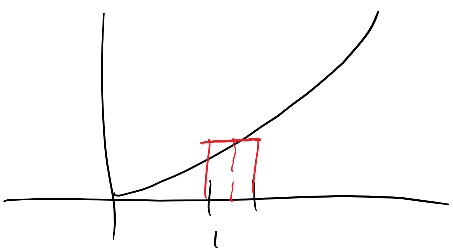
Calculate ~~R_4 and~~ R_6 for $f(x) = x^2$ on the interval [1, 3].



$$\frac{1}{3}\cdot\left(\frac{4}{3}\right)^2 + \frac{1}{3}\left(\frac{5}{3}\right)^2 + \frac{1}{3}(2)^2 + \frac{1}{3}\left(\frac{7}{3}\right)^2 + \frac{1}{3}\left(\frac{8}{3}\right)^2 + \frac{1}{3}(3)^2$$

M_6:

$$\frac{1}{3}\left[\left(\frac{7}{6}\right)^2 + \left(\frac{9}{6}\right)^2 + \left(\frac{11}{6}\right)^2 + \left(\frac{13}{6}\right)^2 + \left(\frac{15}{6}\right)^2 + \left(\frac{17}{6}\right)^2\right]$$



Example 2

Calculate R_6, L_6 and M_6 for $f(x) = x^{-1}$ on $[2, 4]$.

Example 3 – Calculating Area as a Limit

Calculate the area under the graph of f(x) = x over [0, 4] in three ways:

a. $\lim_{N \to \infty} R_N$

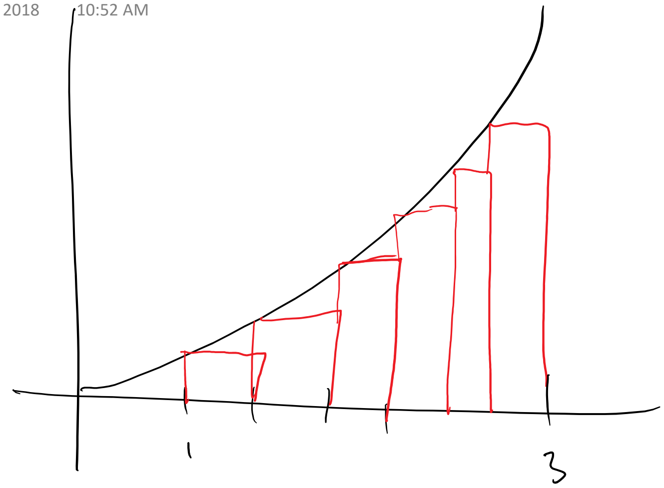
b. $\lim_{N \to \infty} L_N$

c. Using geometry

Example 4

Let A be the area under the graph of f(x) = $2x^2 - x + 3$ over [2, 4]. Find a formula for R_N and compute A as the limit $\lim_{N \to \infty} R_N$.

L6



$\frac{308}{1-3}$