

6.5 Average value (review)

$$\bar{f} = \frac{1}{b-a} \int_a^b f(x) dx$$

ex: Find \bar{f} for $f(x) = \frac{x^2-4}{x}$, $[1,3]$

$$\bar{f} = \frac{1}{3-1} \int_1^3 \frac{x^2-4}{x} dx$$

$$= \frac{1}{2} \int_1^3 \left(x - \frac{4}{x}\right) dx$$

$$= \frac{1}{2} \left(\frac{x^2}{2} - 4 \ln|x| \right) \Big|_1^3$$

$$= \frac{1}{2} \left(\frac{3^2}{2} - 4 \ln 3 - \frac{1}{2} \right) = \boxed{2 - 2 \ln 3}$$