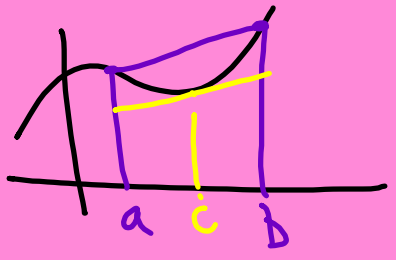
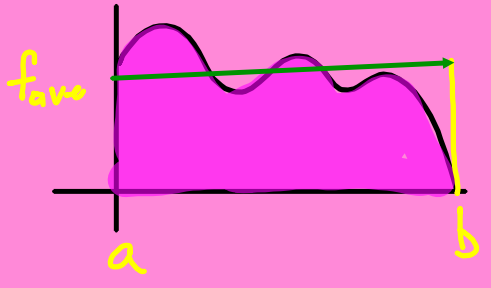
Mean Value Theorem + CAS

Mean Value Theorem for Integrals



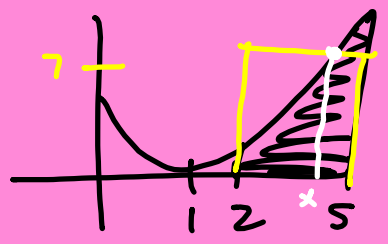
Derivatives



$$(b-a)\cdot f_{ave} = \int_a^b f(x)\,dx$$

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

$f(x) = x^2 - 2x + 1 \quad a = 2 \quad b = 5$



$$f_{ave} = \frac{1}{5-2}\int_2^5 (x^2 - 2x + 1)\,dx$$

$$= \frac{1}{3}\left[\frac{x^3}{3} - \frac{2x^2}{2} + x\right]\Big|_2^5$$

$$= 7$$

At what x-value does f_{ave} occur?

$7 = x^2 - 2x + 1$

$0 = x^2 - 2x - 6$

quadratic formula

Answer must fall between a & b.