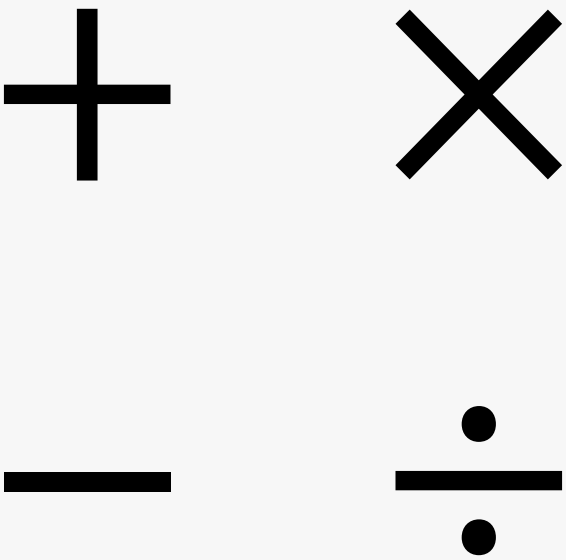

INTEGRATION BY PARTS THEOREM

FORMULA

$$\int f g' \, dx = f g - \int f' g \, dx$$

- LET $a, b \in \mathbb{R}$ WITH $a < b$
- LET $f : [a,b] \to \mathbb{R}$
- LET $g : [a,b] \to \mathbb{R}$
- SUPPOSE f, g DERIVABLE AND CONTINUES IN $[a,b]$ WITH
  - $f'[a,b] \to \mathbb{R}$
  - $g'[a,b] \to \mathbb{R}$

SO

$$\int f(x) g'(x) \, dx = f(x) g(x) - \int f'(x) g(x) \, dx$$

AND

$$\int_a^b g(x) g'(x) \, dx = \Big[f(x) g(x) \Big]_a^b - \int_a^b f'(x) g(x) \, dx$$