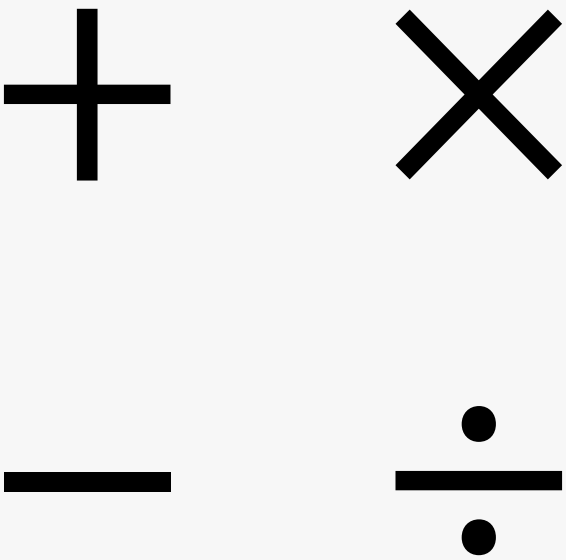

INTEGRATION BY SUBSTITUTION

- LET a, b WITH $a < b$
- LET I BE A NON DEGENERATE INTERVAL
- LET $f: [a,b] \to \mathbb{R}$ AND $g: I \to \mathbb{R}$ TWO FUNCTIONS SUCH THAT

  $f([a,b]) \subseteq I$ IN SUCH A WAY THAT IS IT POSSIBLE DEFINING THE

  COMPOSITE FUNCTION $g \circ f: [a,b] \to \mathbb{R}$

SUPPOSE THAT:

- f IS DERIVABLE ON $[a,b]$
- $f': [a,b] \to \mathbb{R}$ CONTINOUS ON $[a,b]$
- g CONTINOUS ON I
- LET G BE A PRIMITIVE OF g ON I

SO

$$\int g(f(x)) f'(x)\,dx = G(f(x)) + c \qquad x \in [a,b] \qquad c \in \mathbb{R}$$

AND

$$\int_a^b g(f(x))\, f'(x)\,dx = G(f(b)) - G(f(a))$$