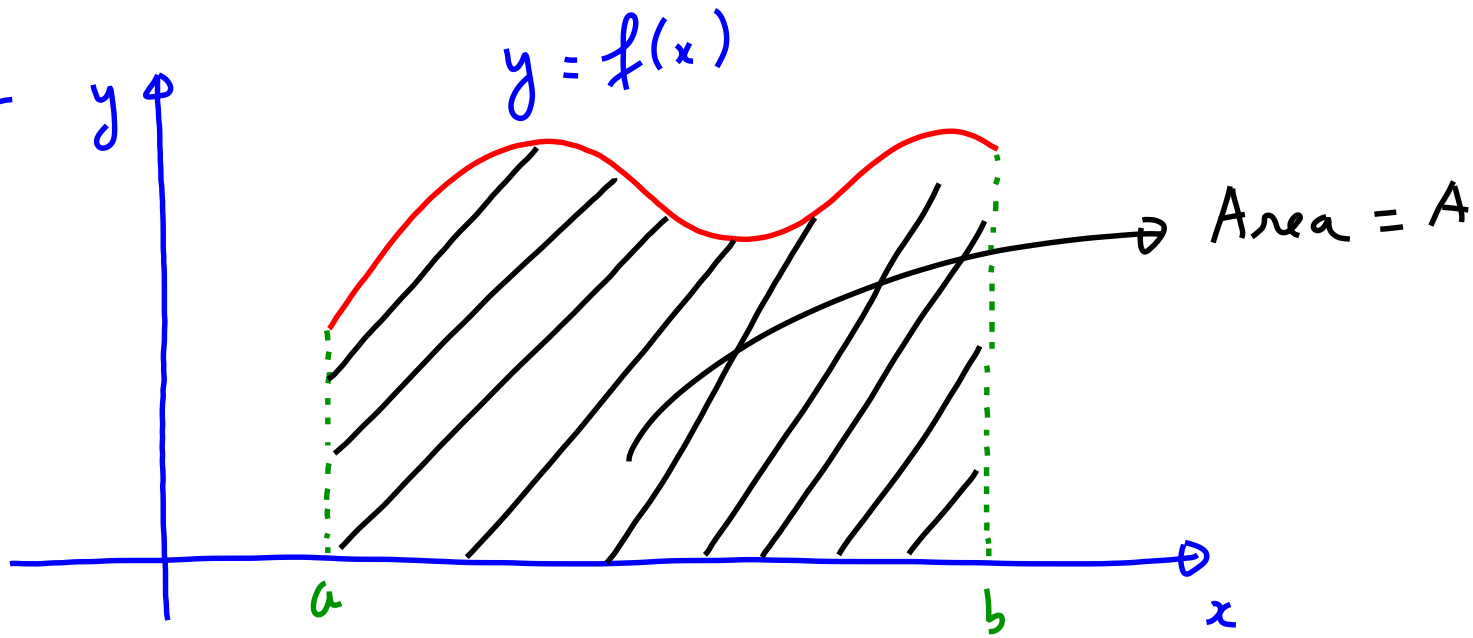
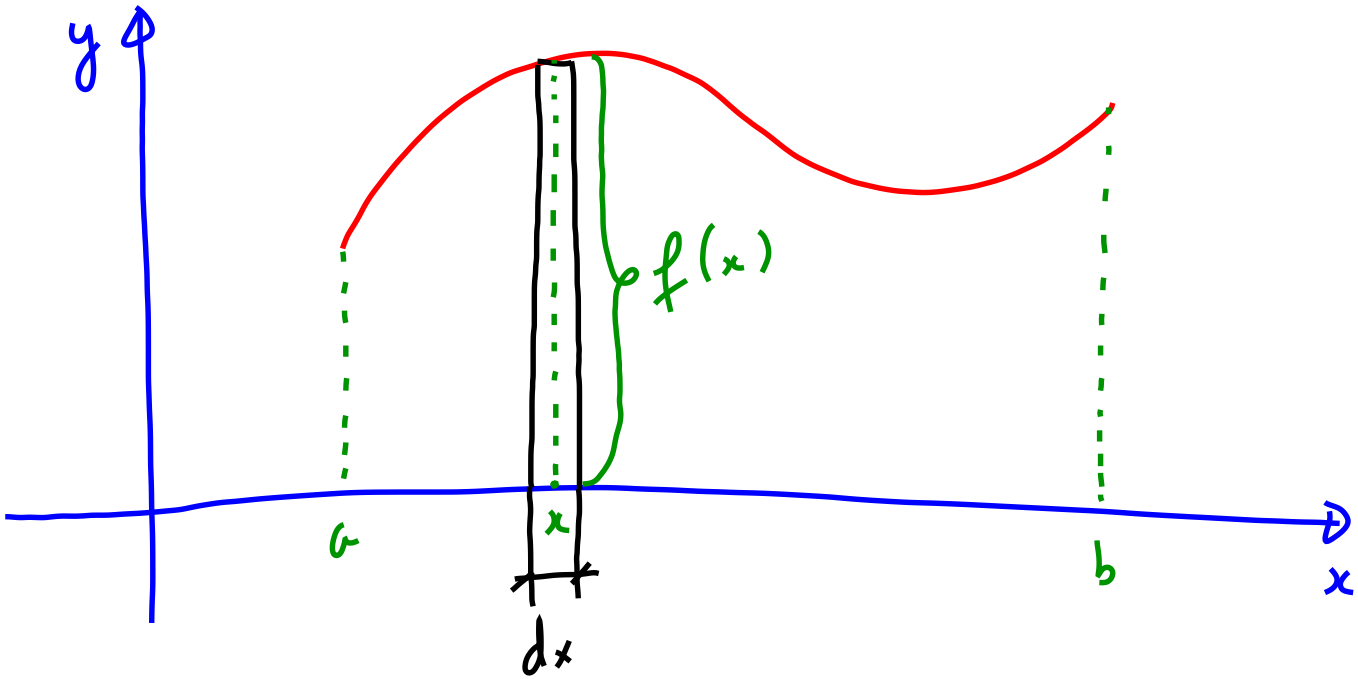
6.1. Areas between curves

Recall



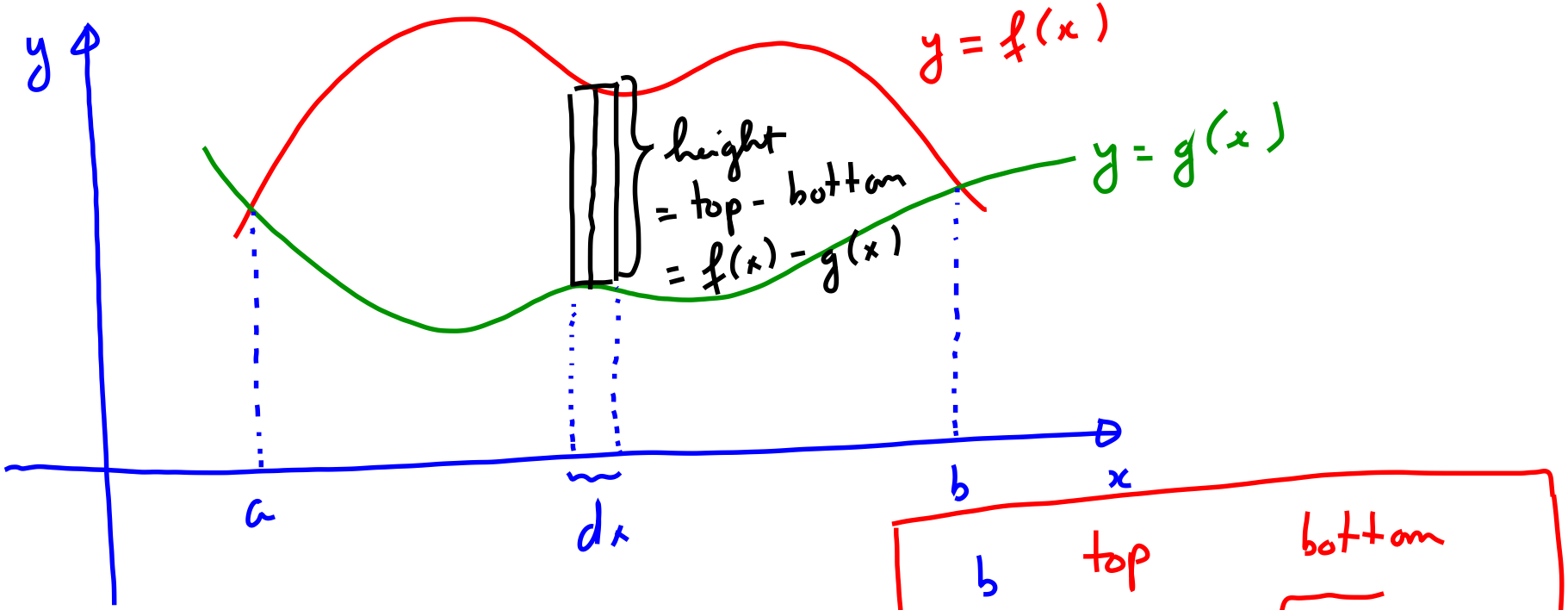
$$\int_a^b f(x)\,dx = \text{Area } A$$



$\int_a^b f(x)\,dx$ = area under $y = f(x)$; $a \le x \le b$

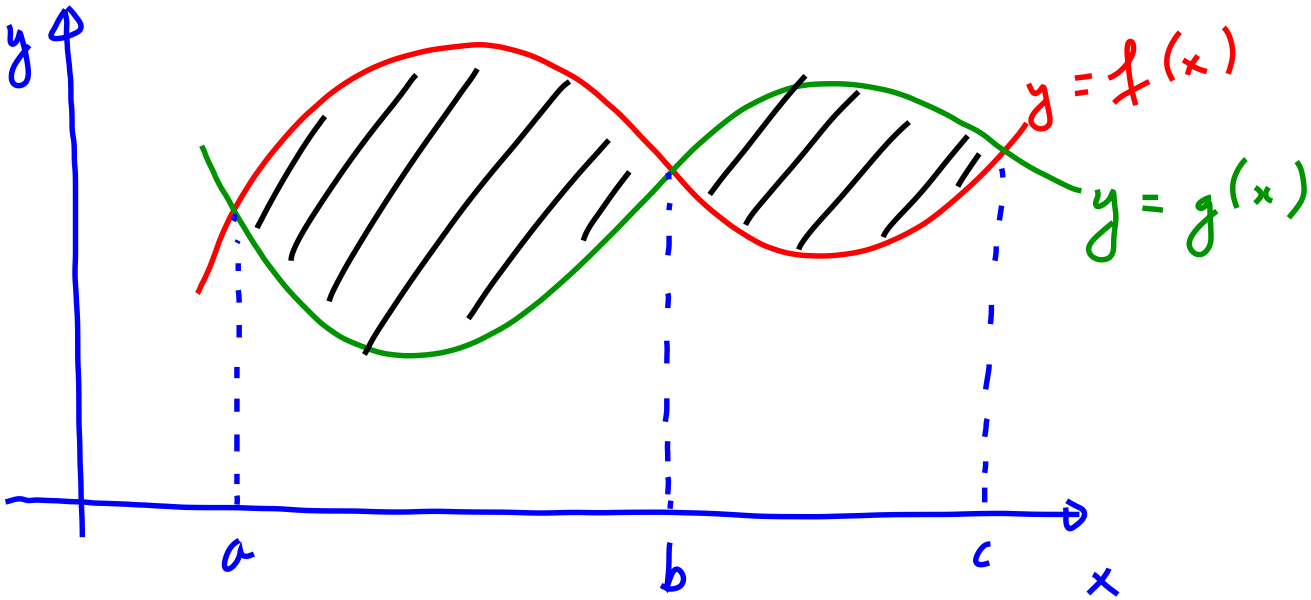
Infinite

$f(x)\,dx$: height × width of small rectangle



Area between $y = f(x)$ and $y = g(x)$; $f(x) \geq g(x)$, $a \leq x \leq b$ $=$

$$\int_a^b (\underbrace{f(x)}_{\text{top}} - \underbrace{g(x)}_{\text{bottom}})\,dx$$



$$\text{Shaded area} = \int_a^b \left(f(x) - g(x)\right) dx + \int_b^c \left(g(x) - f(x)\right) dx$$