§18

$f: \mathbb{R}^2 \to \mathbb{R}$
$g: \mathbb{R}^2 \to \mathbb{R}$
$c \in \mathbb{R}$

① $$\iint_R c\,f(x,y)\,dA = c \iint_R f(x,y)\,dA$$

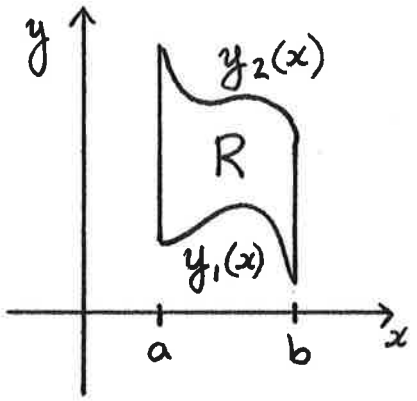
② $$\iint_R \big(f(x,y) + g(x,y)\big)\,dA = \iint_R f(x,y)\,dA + \iint_R g(x,y)\,dA$$

③ If $f(x,y) \le g(x,y)$,

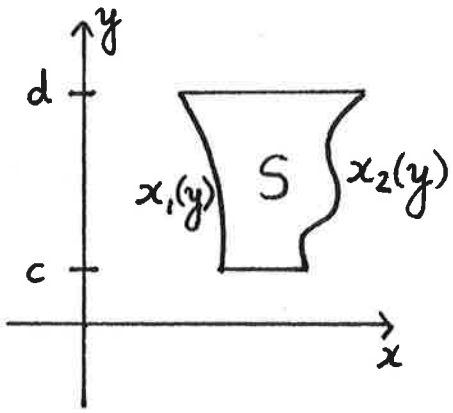
then $$\iint_R f(x,y)\,dA \le \iint_R g(x,y)\,dA.$$

④ If R_1 and R_2 intersect only along their sides, then

$$\iint_{R_1} f(x,y)\,dA + \iint_{R_2} f(x,y)\,dA = \iint_{R_1 \text{ and } R_2} f(x,y)\,dA.$$



$$R = \{(x,y): a \le x \le b,\ y_1(x) \le y \le y_2(x)\}$$



$$S = \{(x,y): c \le y \le d,\ x_1(y) \le x \le x_2(y)\}$$