

PROPERTIES OF THE DEFINITE INTEGRAL

-1. $\int_a^a f(x)dx = 0$

0. $\int_b^a f(x)dx = -\int_a^b f(x)dx$

1. $\int_a^b c dx = c(b - a)$

2. $\int_a^b (f(x) + g(x))dx = \int_a^b f(x)dx + \int_a^b g(x)dx$

3. $\int_a^b c f(x)dx = c \int_a^b f(x)dx$

4. $\int_a^b (f(x) - g(x))dx = \int_a^b f(x)dx - \int_a^b g(x)dx$

5. $\int_a^c f(x)dx + \int_c^b f(x)dx = \int_a^b f(x)dx$

6. If $f(x) \geq 0$ for all $a \leq x \leq b$, then $\int_a^b f(x)dx \geq 0$.

7. If $f(x) \geq g(x)$ for all $a \leq x \leq b$, then $\int_a^b f(x)dx \geq \int_a^b g(x)dx$.

8. If $m \leq f(x) \leq M$ for all $a \leq x \leq b$, then

$$m(b - a) \leq \int_a^b f(x)dx \leq M(b - a).$$