PROPERTIES OF THE DEFINITE INTEGRAL

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

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

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

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

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

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

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

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

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

8. If $m \leq f(x) \leq M$ for all $a \leq x \leq b$, **then** $m(b-a) \leq \displaystyle\int_a^b f(x)dx \leq M(b-a).$