

## Properties of the Definite Integral

$$1. \int_a^a f(t) dt = 0$$

$$2. \int_a^b cf(t) dt = c \int_a^b f(t) dt$$

$$3. \int_b^a f(t) dt = - \int_a^b f(t) dt$$

$$4. \int_a^b f(t) + g(t) dt = \int_a^b f(t) dt + \int_a^b g(t) dt$$

$$5. \int_a^b f(t) - g(t) dt = \int_a^b f(t) dt - \int_a^b g(t) dt$$

$$6. \int_a^b f(t) dt = \int_a^c f(t) dt + \int_c^b f(t) dt$$

7. If  $m \leq f(t) \leq M$  for all values of  $t$  in the interval  $[a,b]$ , then

$$m(b-a) \leq \int_a^b f(t) dt \leq M(b-a)$$

8. If  $f(t) \leq g(t)$  for all values of  $t$  in the interval  $[a,b]$ , then

$$\int_a^b f(t) dt \leq \int_a^b g(t) dt$$