Chapter-8

Application of Integrals

- The area of the region bounded by the curve y = f (x), x-axis and the lines x = a and x = b (b > a) is given by the formula: $Area = \int_a^b y\,dx = \int_a^b f(x)\,dx.$

- The area of the region bounded by the curve $x = \varphi\,(y)$), y-axis and the lines y = c, y = d is given by the formula: $Area = \int_c^b x\,dy = \int_c^d \theta(y)\,dy$

- The area of the region enclosed between two curves y = f (x), y = g (x) and the lines x = a, x = b is given by the formula, $Area = \int_a^b [f(x)\text{-}g(x)]\,dx, \text{ where, } f(x) \geq g(x) \text{ in } [a, b]$

- If $f(x) \geq g(x)$ in $[a,c]$ and $f(x) \leq g(x)$ in $[c,b], a < c < b$, then

  $Area = \int_a^c [f(x) - g(x)]\,dx + \int_c^b [g(x)]\,dx.$