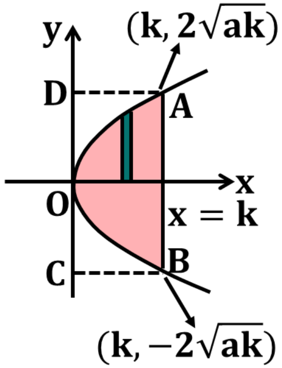
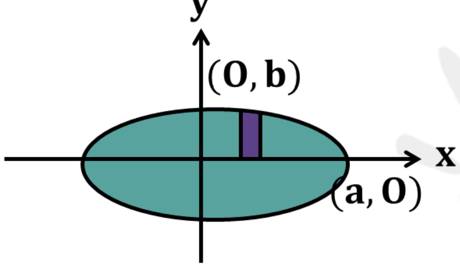
Area Under the Curve



(5) whole area of ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

Area $= |\pi ab|$



4. Finding Area by Shifting of Origin

Shifting of Origin

Since area remains invariant even if the coordinate axes are shifted.

Hence, shifting of origin in many cases prove to be very convenient in computing the areas.

area of $\frac{(x-1)^2}{4}+\frac{(y+2)^2}{9}=1$

$\therefore$ Area $= \pi.(2).(3) = 6\pi$

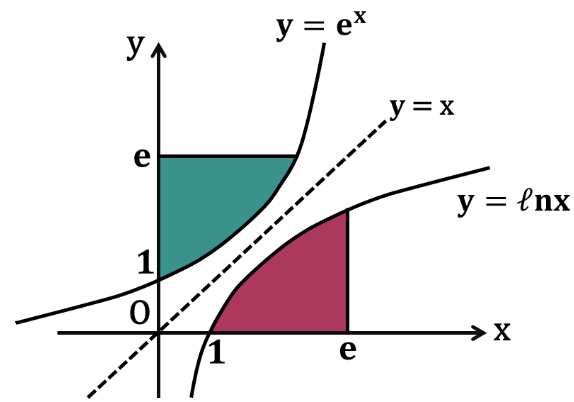
5. Area enclosed by inverse of a function

The area bounded by a curve (say y = f(x)) on x axis is equal to

The area bounded by the inverse of that curve $(f^{-1}(x))$ on y axis.

e.g.

A_1		A_2
Area bounded by $f(x) = \ell nx$ $(x = 1)$ & $(x = e)$ & x – axis	=	Area bounded by $f^{-1}(x) = e^x$ $(y = 1)$ & $(y = e)$ & y – axis



6. Variable Area Greatest & Least Value

Concept of Variable Area

(Greatest And Least Value)

$y = f(x) \longrightarrow$ A monotonic function in (a, b)

Then, the area bounded by :

ordinates at x = a, x = b

$y = f(x)$

$y = f(c)$, [where $c \in (a, b)$]

is minimum when $c = \frac{a+b}{2}$