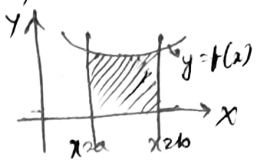
AREAS

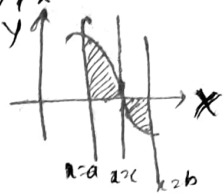
① Area formed by the curve $y = f(x)$, x-axis & ordinates $x = a, x = b$

$$A = \int_a^b f(x)\,dx$$



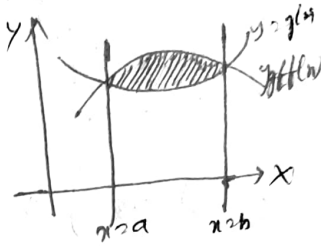
② $y = f(x)$ intersects X-axis at c, x-axis & ordinates $x = a$, & $x = b$

$$A = \int_a^c f(x)\,dx + \int_c^b -f(x)\,dx = \int_a^c f(x)\,dx - \int_c^b f(x)\,dx$$



③ If 2 curves intersects at $x = a$ & $x = b$ then area formed by the curves

$$A = \int_a^b (f(x) - g(x))\,dx$$

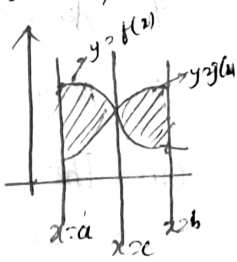


④ Area formed by the curves $y = f(x)$, $y = g(x)$?

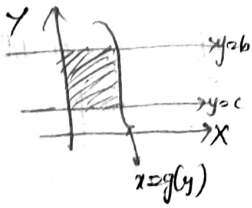
$$A = \int_a^b [f(x) - g(x)]\,dx$$

⑤ If 2 curves $y = f(x)$, $y = g(x)$ are intersects at $x = c$ then the area formed by the curves $y = f(x)$, $y = g(a)$, X-axis & ordinates $x = a, x = b$

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

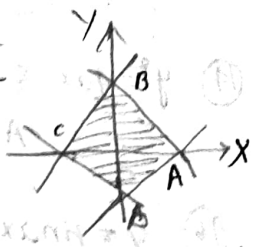


⑥ Area formed by the curve $x = g(y)$, y-axis & the lines $y = b$, $y = c$ is given by $A = \int_b^c g(y)\,dy$



formulae :

① Area formed by the lines $ax \pm by + c = 0$ is $\dfrac{2c^2}{|ab|}$



② Area of parallelogram formed by the lines

$a_1x + b_1y + c_1 = 0$, $a_1x + b_1y + d_1 = 0$

$a_2x + b_2y + c_2 = 0$, $a_2x + b_2y + d_2 = 0$

is $\left| \dfrac{(c_1 - d_1)(c_2 - d_2)}{a_1b_2 - a_2b_1} \right|$

(3) Area formed by the curve $y = ax^2 + bx + c$ & $y = 0$ is $\frac{(\Delta)^{3/2}}{6a^2}$

$\Delta = b^2 - 4ac$

(4) Area formed by the curve $x = ay^2 + by + c$ & $x = 0$ is $\frac{(\Delta)^{3/2}}{6a^2}$

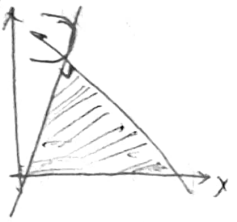
(5) Area bounded by the curves $y = ax^2 + bx + c$ & $y = mx + k$ is $\frac{(\Delta)^{3/2}}{6a^2}$

Δ for $ax^2 + (b-m)x + (c-k) = 0$

(6) Area bounded by the curves $x = ay^2 + by + c$ & $x = my + k$ is $\frac{(\Delta)^{3/2}}{6a^2}$

Δ for $ay^2 + (b-m)y + (c-k) = 0$

(7) Area of Δ^{le} formed by tgt & normal to curve $y = f(x)$ at $P(x_1, y_1)$ & x-axis is $\frac{y_1^2}{2}\left|m + 1/m\right|$, where $m = \left(\frac{dy}{dx}\right)_P$



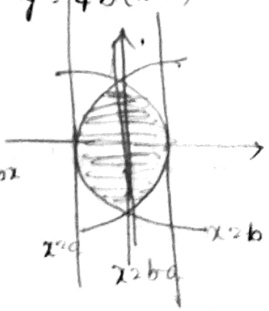
(8) Area of Δ^{le} formed by tgt & normal to curve $y = f(x)$ at $P(x_1, y_1)$ & y-axis is $\frac{x_1}{2}\left|m + 1/m\right|$.

→ area formed by $xy = c^2$ & its asymptotes is $2c^2$

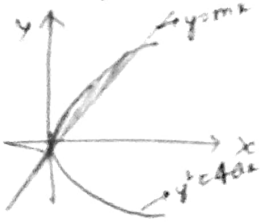
(9) Area bounded by the curve $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is πab

(10) Area bounded by the curve $x^2 + y^2 = a^2$ is πa^2

(11) The area b/w the curves $y^2 = 4a(x+a)$ & $y^2 = 4b(b-x)$ is $\frac{4\sqrt{ab}}{3}(a+b)$



(12) Area formed by the curves $y^2 = 4ax$ & $y = mx$ is $\frac{8a^2}{3m^3}$



(13) $y^2 = 4ax$, $x^2 = 4by$

$A = \frac{16ab}{3}$

(14) $y^2 = 4ax$ & L-R

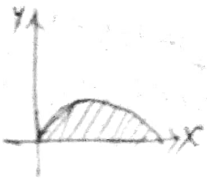
$A = 8a^2/3$

(15) $\sqrt{x} + \sqrt{y} = \sqrt{a}$

$A = a^2/6$

(16) $y = \sin ax$ & x-axis in $[0, n\pi]$

$A = \frac{2n}{a}$



$y = \cos ax$ & x-axis in $[0, n\pi]$

$A = 2n/a$