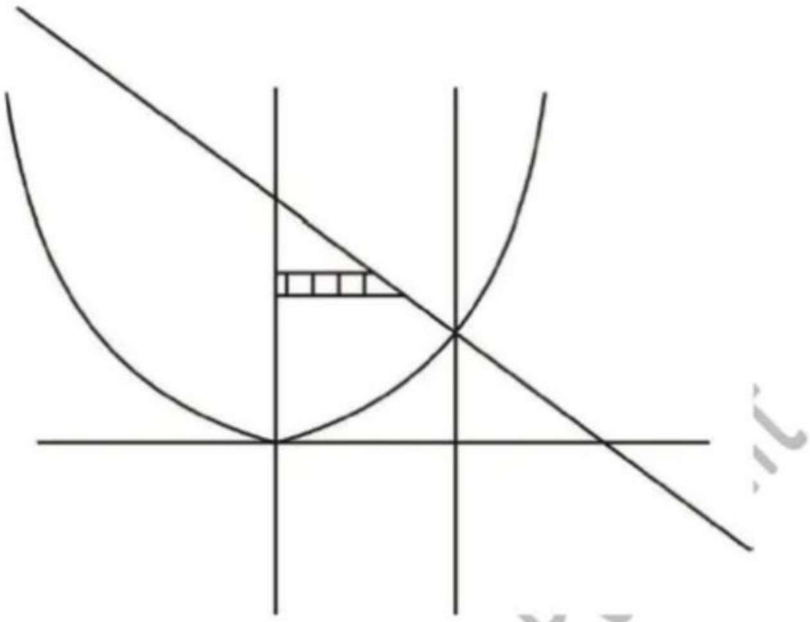
Change of order in mixed region

We know that if strip move on more than two curve then tl
region is called mixed region.

Example :



Then for double integration, we divide into simple region.

Q.1. After the change of order of integration ,the double integral $\int_0^8 \int_{x^{1/3}}^2 dy dx$ becomes **CUCET 2021**

(a) $\int_{x^{1/3}}^2 \int_0^8 dx dy$

(b) $\int_0^2 \int_0^{y^3} dx dy$

(c) $\int_8^0 \int_2^{x^{1/3}} dx dy$

(d) $\int_0^2 \int_{y^3}^0 dx dy$

Q.2. Let f : R →R be continuous function and a > 0 then the integral $\int_0^a \int_0^x f(y)\,dy\,dx$ equals **JAM – 2009**

(a) $\int_0^a y f(y)\,dy$ (b) $\int_0^a (a-y) f(y)\,dy$

(c) $\int_0^a (y-a) f(y)\,dy$ (d) $\int_a^0 y f(y)\,dy$

Q3. The value of $I = \int_0^1 \int_0^x x^2 e^{xy}\, dx dy$ is

(a) $\frac{e+2}{2}$ (b) $\frac{e-2}{2}$

(c) $\frac{e-1}{2}$ (d) $\frac{e+1}{2}$

Q4. $\int_{0}^{\pi/2}\int_{x}^{\pi/2}\frac{\sin y}{y}\,dy\,dx$ is equal to

(a) 1 (b) 2

(c) 3 (d) 4

Q5. The value of the double integral $\int_0^a \int_y^a \frac{x}{x^2+y^2}\,dx\,dy$ is

(a) $\frac{\pi a}{4}$

(b) $\frac{3\pi a}{4}$

(c) $-\frac{\pi a}{3}$

(d) $\frac{2\pi a}{3}$

Q6, If $\int_{y=0}^{1}\int_{x=0}^{y+4} dx\,dy = \int_{x=0}^{4}\int_{y=0}^{1} dy\,dx + \int_{x=4}^{5}\int_{y=g(x)}^{h(x)} dy\,dx$, then the function g(x) and h(x) are, respectively **JAM – 2009**

(a) (x – 4) and 1 (b) (x + 4) and 1

(c) 1 and (x – 4) (d) 1 and (x + 4)

Q7. Evaluate $\iint \sqrt{4x^2 - y^2}\, dx.dy$ over region bounded by

y = 0, y = x, x = 1 is

(a) $\frac{\sqrt{3}}{6} + \frac{\pi}{9}$

(b) $\frac{\sqrt{3}}{5} + \frac{\pi}{9}$

(c) $\frac{\sqrt{2}}{3}$

(d) $\frac{\sqrt{7}}{9}$