DPP

DAILY PRACTICE PROBLEMS

Class : XIth
Date :

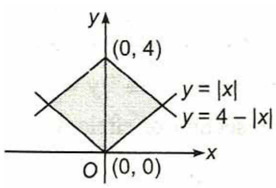
Solutions

Subject : Maths
DPP No. : 10

Topic :-Applications of integrales

1 **(d)**

It is a square of diagonal of length 4 unit and sides is $2\sqrt{2}$



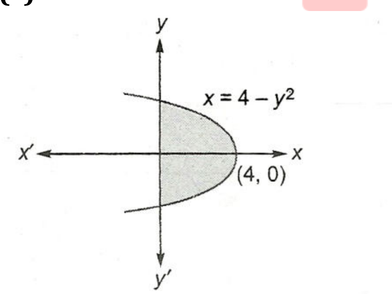
$\therefore$ Required area, $A = (2\sqrt{2})^2 = 8$ sq unit

3 **(c)**

Required area $= \int_{-\pi/3}^{\pi/3} \sec^2 x \, dx$

$= [\tan x]_{-\pi/3}^{\pi/3} = 2\sqrt{3}$ sq unit

4 **(c)**



The required area

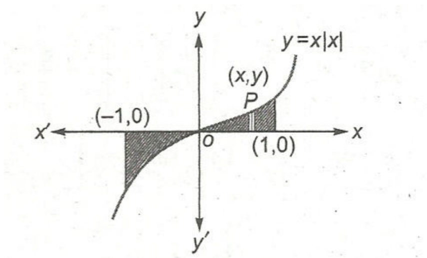
$$= 2 \times \int_0^4 \sqrt{4-x} \, dx$$

$$= 2\left[\frac{(4-x)^{3/2}}{3/2}\right]_0^4 = 2\left[-\frac{2}{3} \times 0 + \frac{2}{3}(4)^{3/2}\right]$$

$$= \frac{32}{2} \text{ sq units}$$

5 **(c)**

Required area $= \left|\int_{-1}^{1} x|x|\, dx\right|$



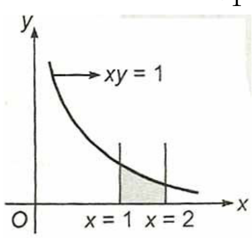
$= \left|\int_{-1}^{0} x|x|\, dx\right| + \int_{0}^{1} x|x| dx$

$= \left|\int_{-1}^{0} - x^2\, dx\right| + \int_{0}^{1} x^2 dx$

$= \left|\left[\frac{-x^3}{3}\right]_{-1}^{0}\right| + \left[\frac{x^3}{3}\right]_{0}^{1} = \frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

8 **(a)**

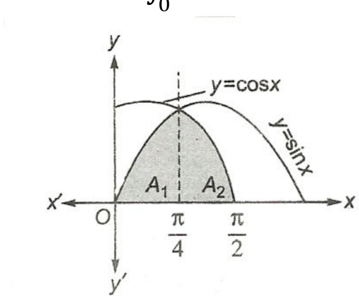
Required area $= \int_1^2 \frac{1}{x} dx$



$= [\log|x|]_1^2 = \log 2$ sq unit

12 **(d)**

Area, $A_1 = \int_0^{\frac{\pi}{4}} \sin x\, dx$



$= -\,[\cos x]_0^{\pi/4}$

$= 1 - \frac{1}{\sqrt{2}}$

$= \frac{\sqrt{2}-1}{\sqrt{2}}$

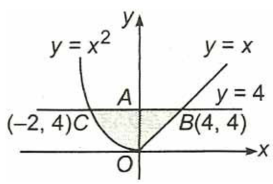
and area, $A_2 = \int_{\pi/4}^{\pi/2} \cos x \, dx$

$= [\sin x]_{\pi/4}^{\pi/2} = \left[1 - \frac{1}{\sqrt{2}}\right] = \frac{\sqrt{2}-1}{\sqrt{2}}$

$\therefore \; A_1 : A_2 = \frac{\sqrt{2}-1}{\sqrt{2}} : \frac{\sqrt{2}-1}{\sqrt{2}} = 1:1$

13 **(c)**

Required area $= \int_{-2}^{0} (4 - x^2)dx + \int_{0}^{4} (4 - x)dx$

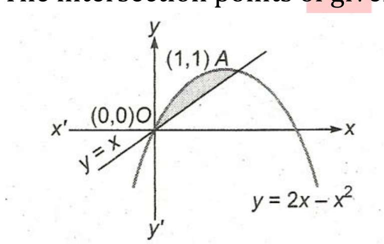


$= \left[4x - \frac{x^3}{3}\right]_{-2}^{0} + \left[4x - \frac{x^2}{2}\right]_{0}^{4}$

$= 8 - \frac{8}{3} + 8 = \frac{40}{3}$ sq unit

15 **(b)**

The intersection points of given curves are (0,0) and (1,1)



$\therefore$ Required area $= \int_0^1 [(2x - x^2) - x]dx$

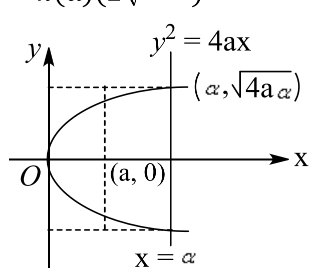
$= \int_0^1 (x - x^2)dx = \left[\frac{x^2}{2} - \frac{x^3}{3}\right]_0^1$

$= \frac{1}{6}$ sq unit

17 **(a)**

Required area $= 2\int_0^{\alpha} \sqrt{4ax}dx$

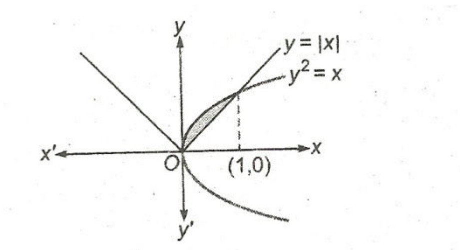
$= k(\alpha)(2\sqrt{4a\alpha})$



$$\frac{8\sqrt{a}}{3}\alpha^{3/2} = 4\sqrt{a}k\alpha^{3/2}$$
$$\Rightarrow k = \frac{2}{3}$$

18 **(c)**

$$\text{Required area} = \int_0^1 (\sqrt{x} - x)dx$$



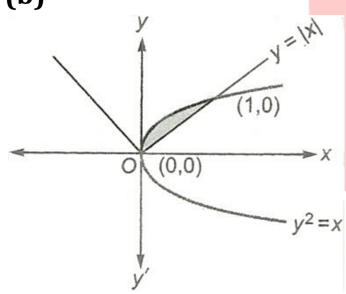
$$= \left[\frac{2}{3}x^{3/2} - \frac{x^2}{2}\right]_0^1 = \frac{1}{6}\text{ sq unit}$$

19 **(b)**

Clearly,

$$\text{Required are} = \int_0^{\pi} a\sin x\,dx = 2a$$

20 **(b)**



$$\text{Required area} = \int_0^1 (\sqrt{x} - x)dx = \left(\frac{2}{3}x^{3/2} - \frac{x^2}{2}\right)_0^1$$
$$= \frac{2}{3} - \frac{1}{2} = \frac{4-3}{6} = \frac{1}{6}\text{ sq unit}$$

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	D	B	C	C	C	A	B	A	C	A
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	D	C	B	B	A	A	C	B	B