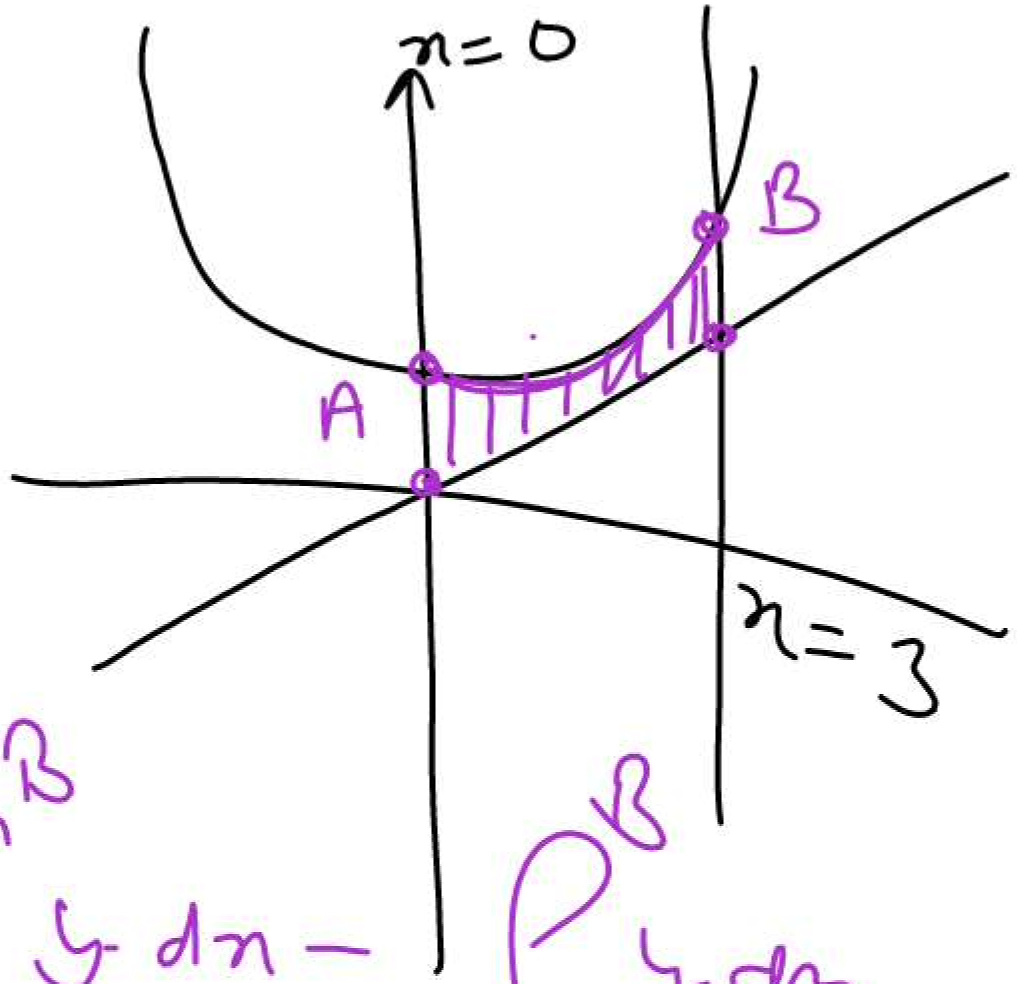
The area of the region bounded by the curves $y = x^2 + 2$, $y = x$, $x = 0$ and $x = 3$ is

(a) $\frac{2}{21}$

(b) 21

(c) $\frac{21}{2}$

(d) $\frac{9}{2}$



$$\int_A^B y\,dx - \int_A^B y\,dx$$

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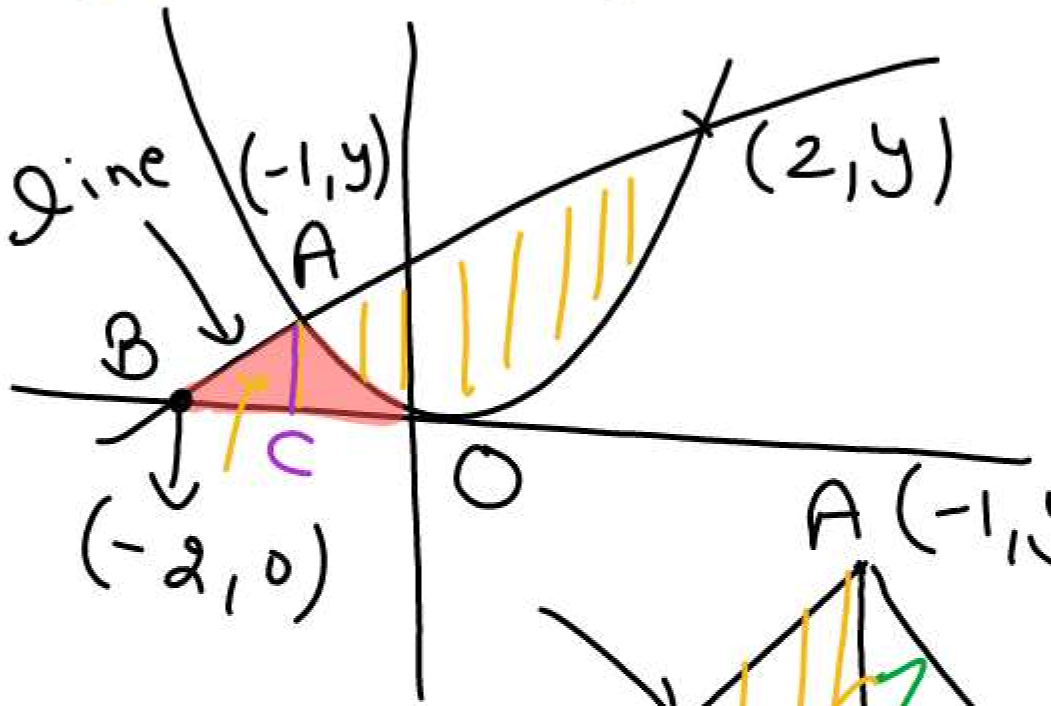
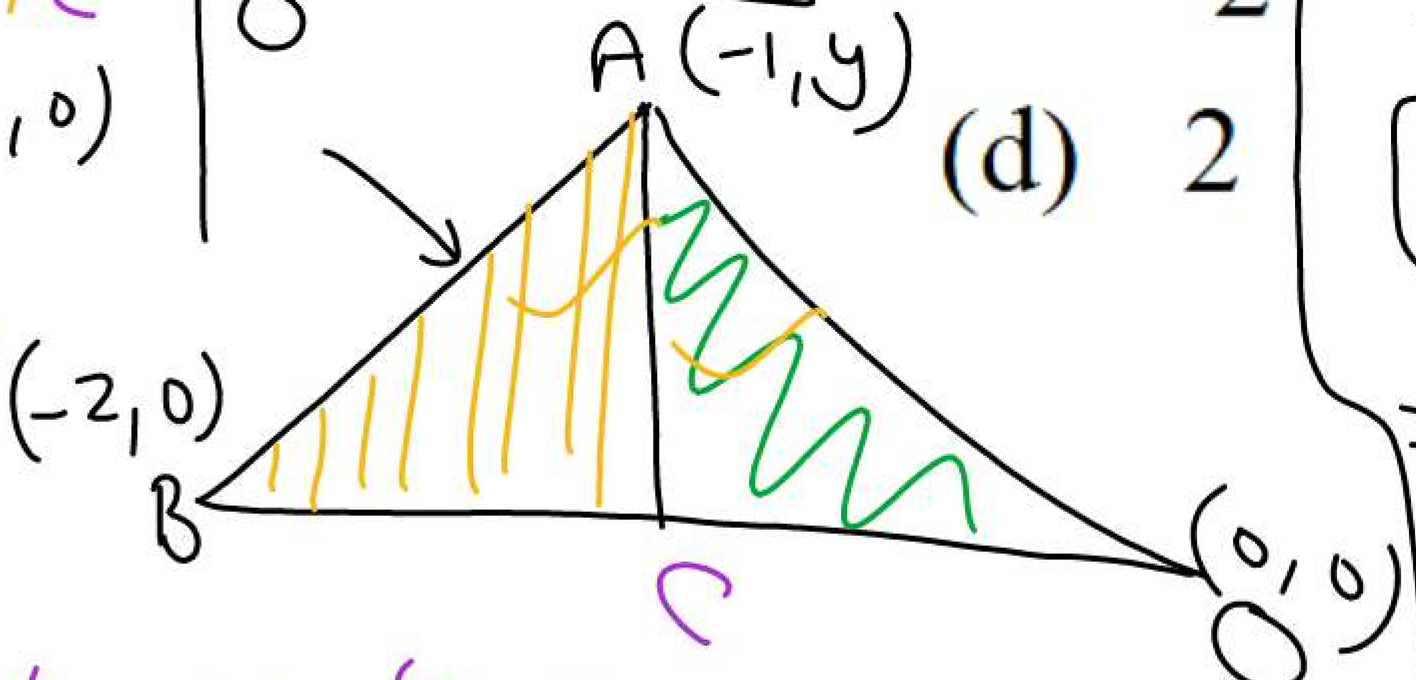
The area of the region enclosed by the parabola $x^2 = y$, the line $y = x + 2$ and the x-axis, is



(a) $\frac{2}{9}$ (b) $\frac{9}{2}$

(c) 9 (d) 2



For A:- intersection

$y = x+2 = x^2 = y$

$\Rightarrow x^2 = x+2$

$x^2 - x - 2 = 0$

$x^2 - 2x + x - 2 = 0$

$x(x-2) + 1(x-2) = 0$

$x = -1$ $x = 2$

Area (O A B O) = Ar(ABC) + Ar(ACO)

$= \int_{-2}^{-1} \frac{y \cdot dx}{\text{line}} + \int_{-1}^{0} \frac{y \cdot dx}{\text{para.}}$

$\Rightarrow \int_{-2}^{-1} (x+2)\cdot dx + \int_{-1}^{0} x^2\, dx$

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

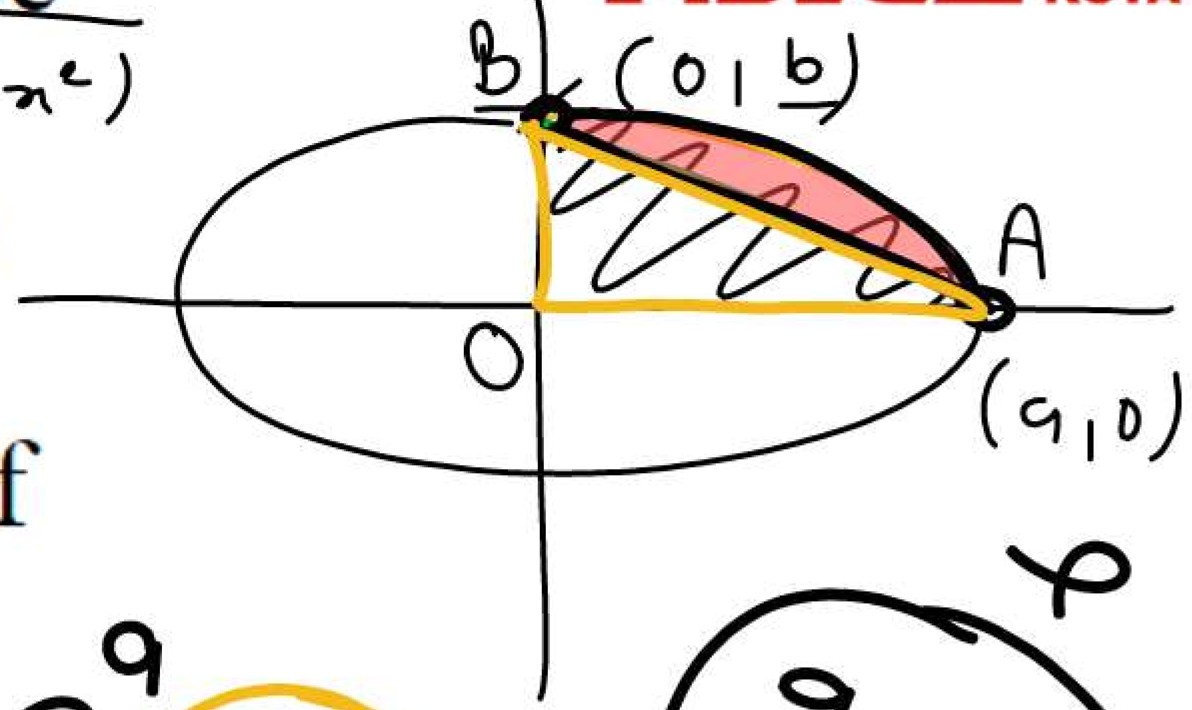
$\Rightarrow \left[\frac{1}{2} - 2 - \left\{\frac{4}{2} - 4\right\}\right] + \left[0 + \frac{1}{3}\right]$

$\frac{1}{2} - \cancel{2} - \cancel{2} + \cancel{4} + \frac{1}{3}$

$\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$

AOB is a positive quadrant of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, where OA = a, OB = b. The area between the arc AB and chord AB of the ellipse is

$\frac{y^2}{b^2} = \frac{a^2-x^2}{a^2} \Rightarrow y = \sqrt{\frac{b^2}{a^2}(a^2-x^2)}$



(a) πab sq. units

(c) $\frac{ab(\pi+2)}{2}$ sq. units

(b) $(\pi-2)ab$ sq. units

(d) ~~$\frac{ab(\pi-2)}{4}$ sq. units~~

$\int_0^a \frac{b}{a}\sqrt{a^2-x^2}\,dx - \frac{ab}{2}$

$\frac{b}{a}\left[\frac{x}{2}\sqrt{a^2-x^2}+\frac{a^2}{2}\sin^{-1}\frac{x}{a}\right]_0^a - \frac{ab}{2}$

$\Rightarrow \frac{b}{a}\left[0+\frac{a^2}{2}\cdot\frac{\pi}{2}-0-0\right]-\frac{ab}{2}$

$\frac{b}{a}\times\frac{a^2}{4}\pi - \frac{ab}{2}$ $\quad \frac{ab}{4}(\pi-2)$

$\int_0^a \underset{\text{ellipse}}{y\,dx} - \int_0^a \underset{\text{line}}{y\,dx}$

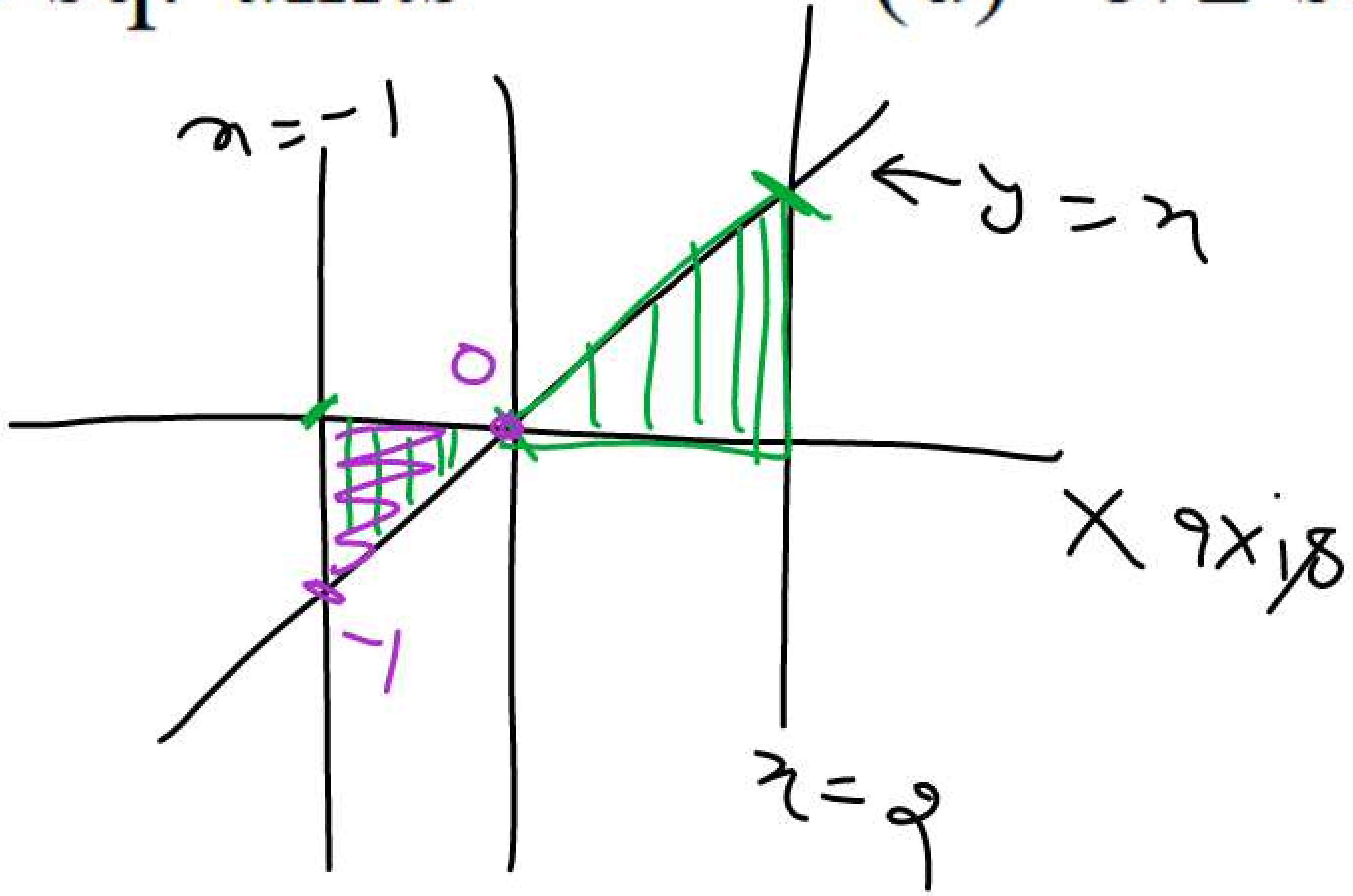
$-$ area(ΔAOB)

$\frac{1}{2}\times a\times b$

The area bounded by the line y = x, x-axis and lines x = – 1 to x = 2, is

(a) 0 sq. unit (b) 1/2 sq. units

(c) 3/2 sq. units (d) 5/2 sq. units



$$\int_0^2 x\,dx + \int_{-1}^0 x.\,dx$$

$\Rightarrow$ intersection $C \Rightarrow -x = 2x-2$
$= 3x = 2 \rightarrow \boxed{x = 2/3}$

x	0	1
y	-2	0

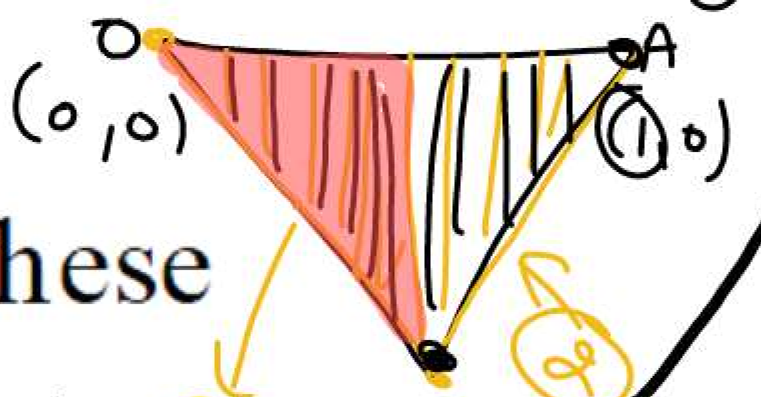
2. The area bounded by the line $y = 2x - 2$, $y = -x$ and x-axis is given by

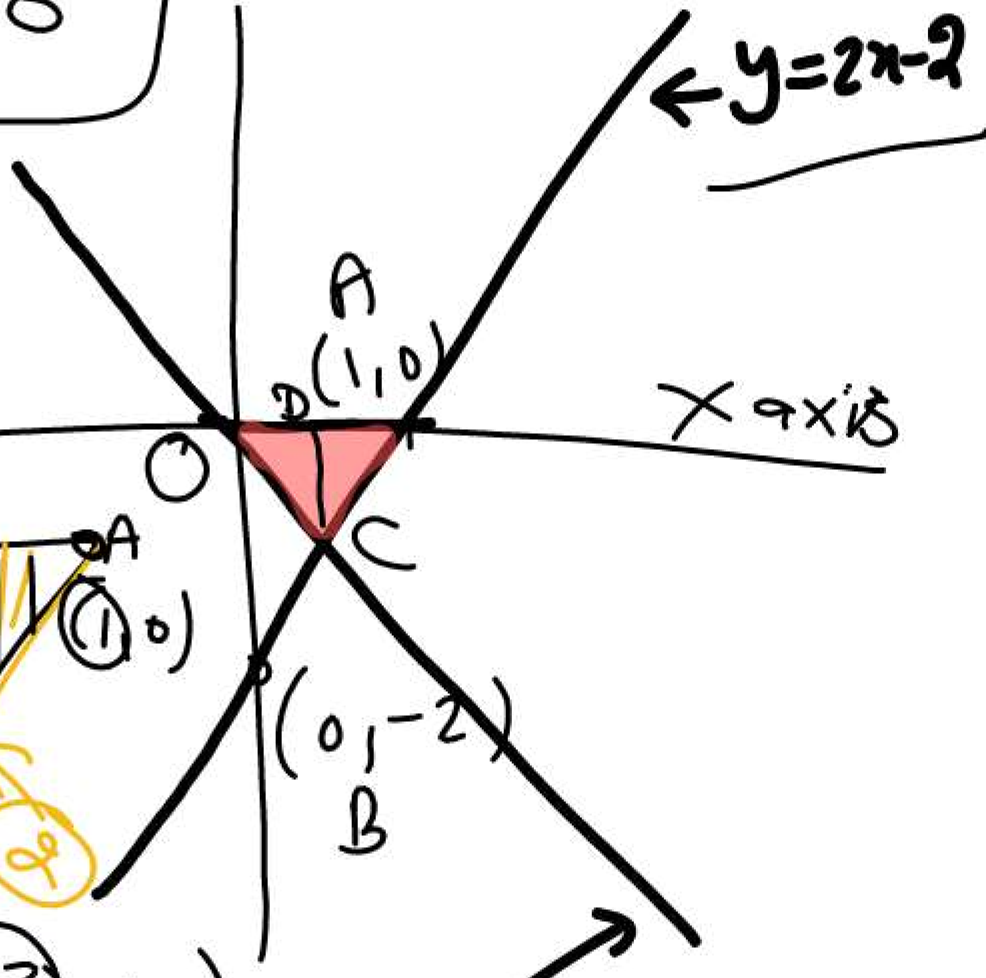
$\frac{7}{3} - \frac{22}{9} = \frac{63-66}{3\cdot 9} = \frac{-3}{3\cdot 9} = -\frac{1}{9}$

(a) $\frac{9}{2}$ sq. units (b) $\frac{43}{6}$ sq. units

$\frac{2}{9} + \frac{1}{9} = \frac{3}{9} = \frac{1}{3}$ $\quad 1 + \frac{4}{3} \quad -2 - \frac{4}{9}$

(c) $\frac{35}{6}$ sq. units (d) None of these





So Total area $OACO = Ar(OCD) + ar(CAD)$

$C\left(\frac{2}{3}, y\right)$

$T\,area(OACO) = \int_0^{2/3} y\,dx + \int_{2/3}^{1} y\cdot dx$

$\left(-\frac{x^2}{2}\right)_0^{2/3} + \left[\frac{2x^2}{2} - 2x\right]_{2/3}^{1}$

$\Rightarrow \int_0^{2/3} -x\cdot dx + \int_{2/3}^{1} (2x-2)\,dx \Rightarrow$

$\Rightarrow \left|\left(-\frac{1}{2}\times\frac{4}{9}\right)\right| + \left|\left[1 - 2 - \frac{4}{9} + \frac{4}{3}\right]\right|$

The area bounded by the curves $x + 2y^2 = 0$ (1) $y^2 = -\frac{x}{2}$

and $x + 3y^2 = 1$ is (2) $3y^2 = 1 - x$

(a) 1 sq. unit $y^2 = \frac{1-x}{3}$ (b) $\frac{1}{3}$ sq. units

$y^2 = -\left[\frac{x-1}{3}\right]$

(c) $\frac{2}{3}$ sq. units (d) $\frac{4}{3}$ sq. units

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

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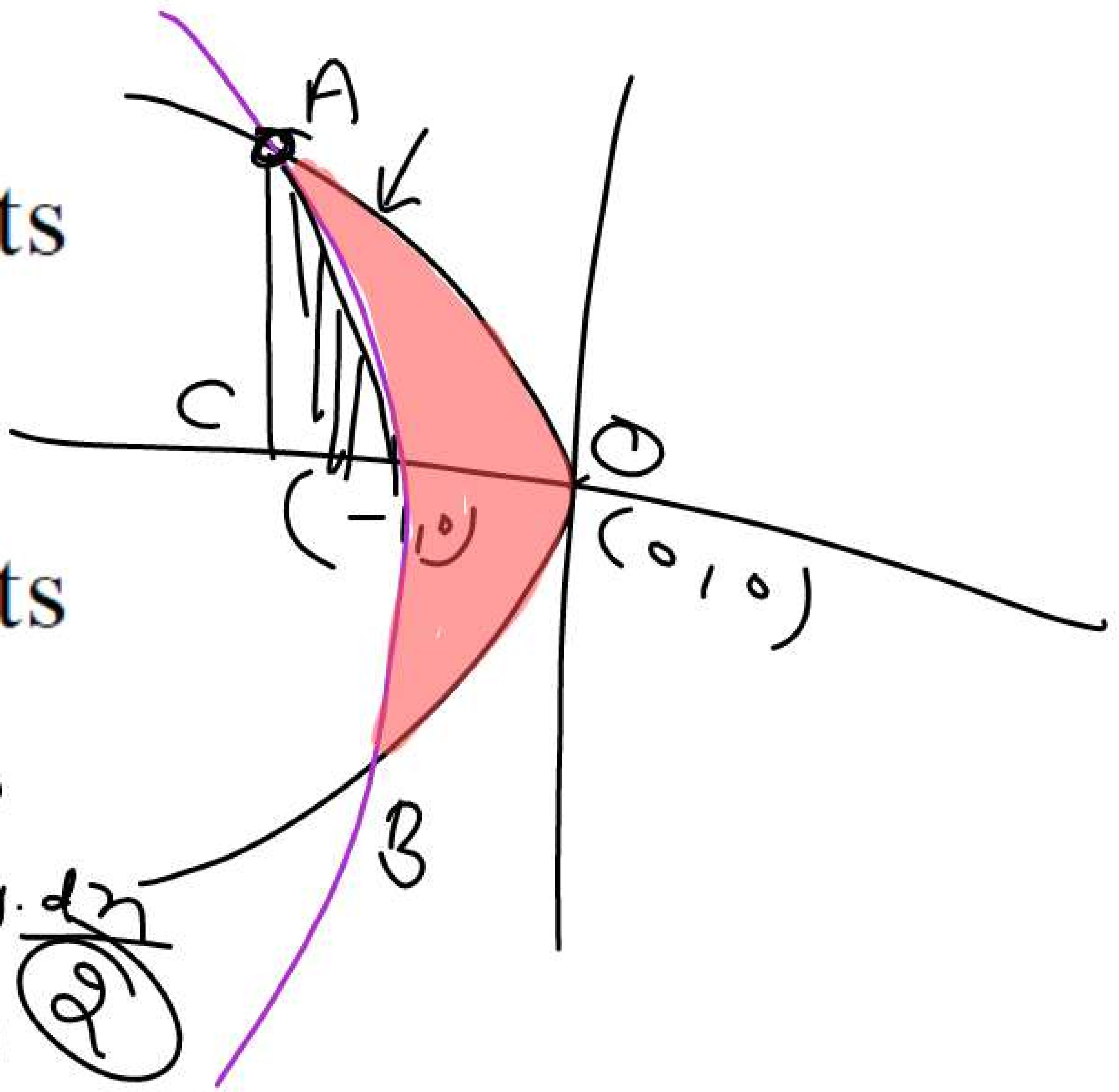
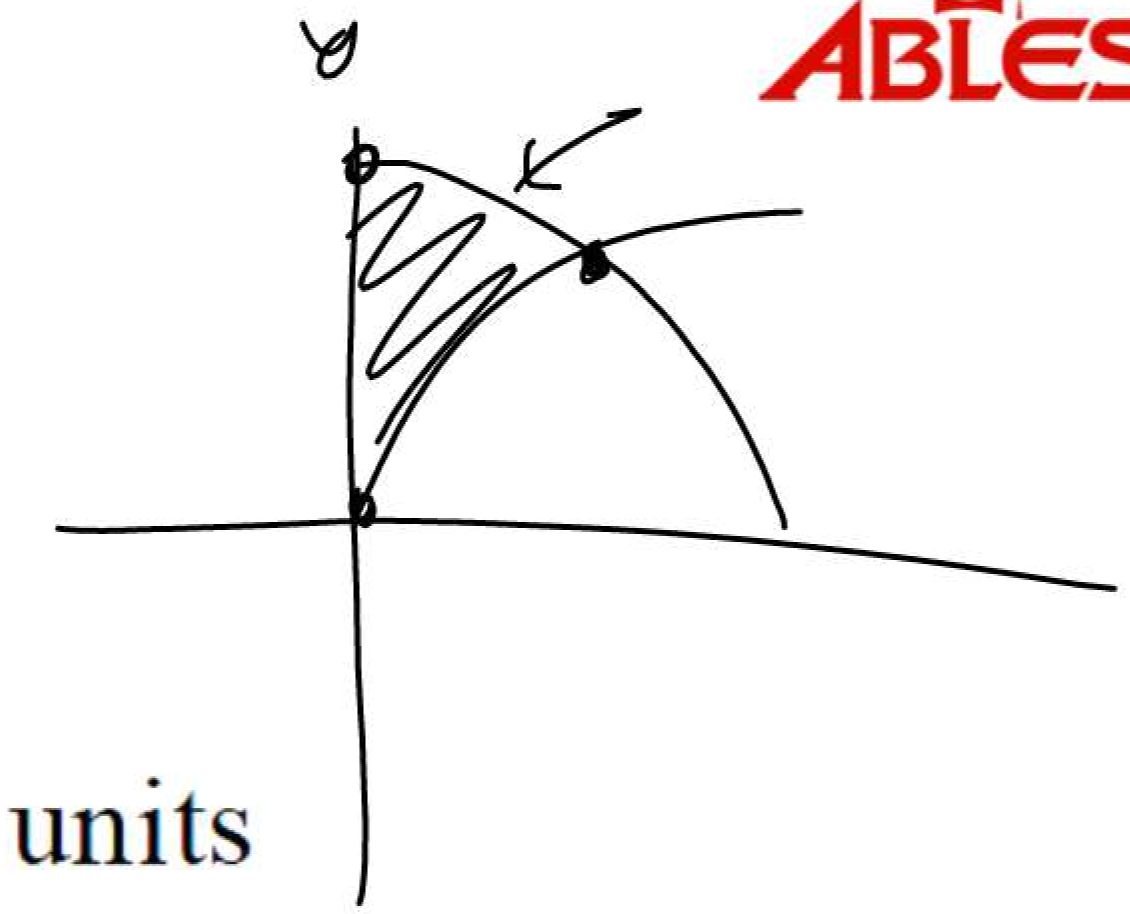
$$\underbrace{\int_A^0 y\,dx}_{1} - \underbrace{\int_A^0 y\,dx}_{2}$$



The area bounded by the curves $y = \sin x$, $y = \cos x$ and $x = 0$ is

(a) $\left(\sqrt{2}-1\right)$ sq. units (b) 1 sq. unit

(c) $\sqrt{2}$ sq. units (d) $\left(1+\sqrt{2}\right)$ sq. units



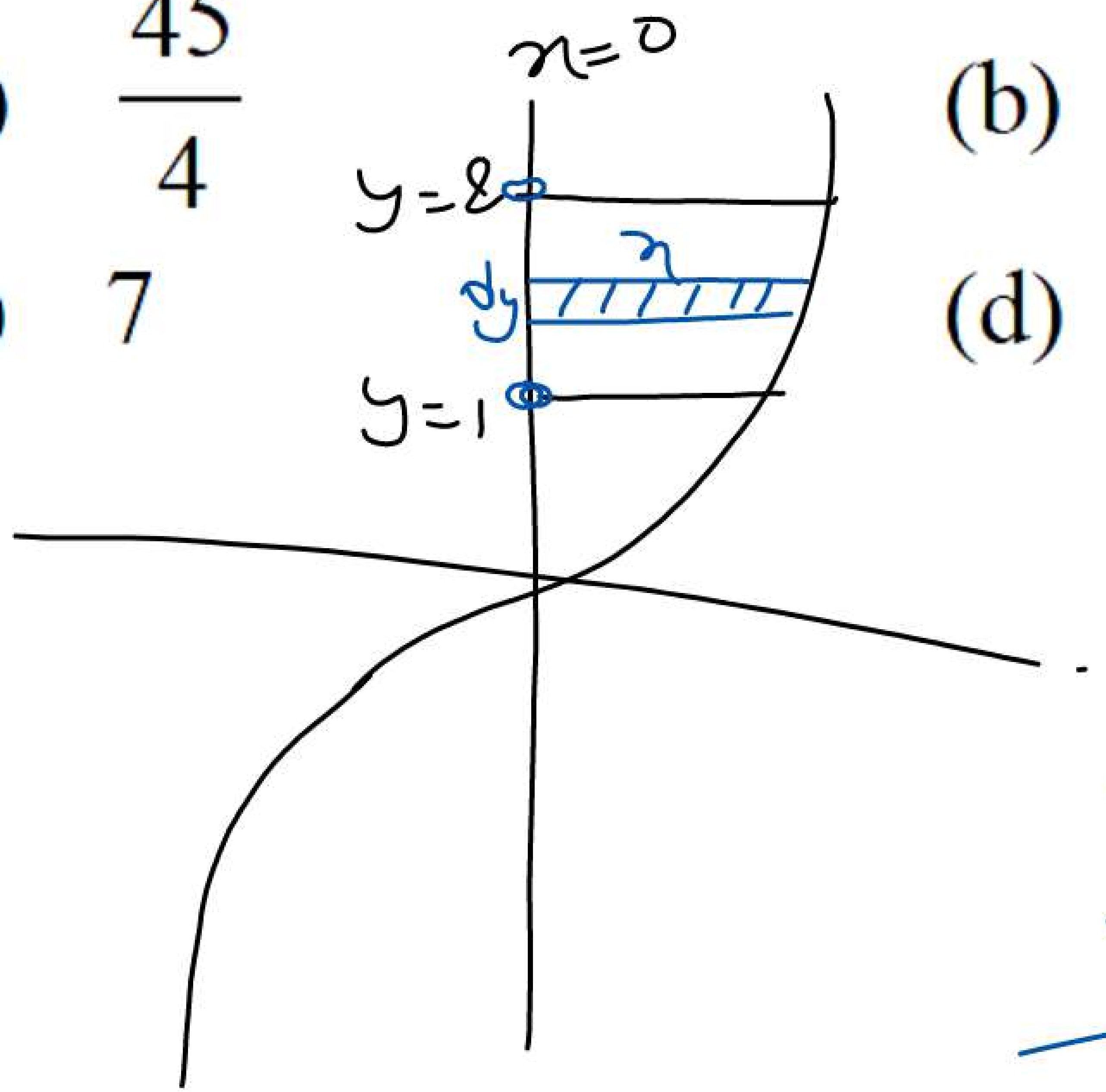
The area enclosed between the graph of $y = x^3$ and the lines $x = 0$, $y = 1$, $y = 8$ is

(a) $\frac{45}{4}$

(b) 14

(c) 7

(d) None of these



$$\int_1^8 x \cdot dy$$

$$\int_1^8 y^{1/3} \cdot dy$$

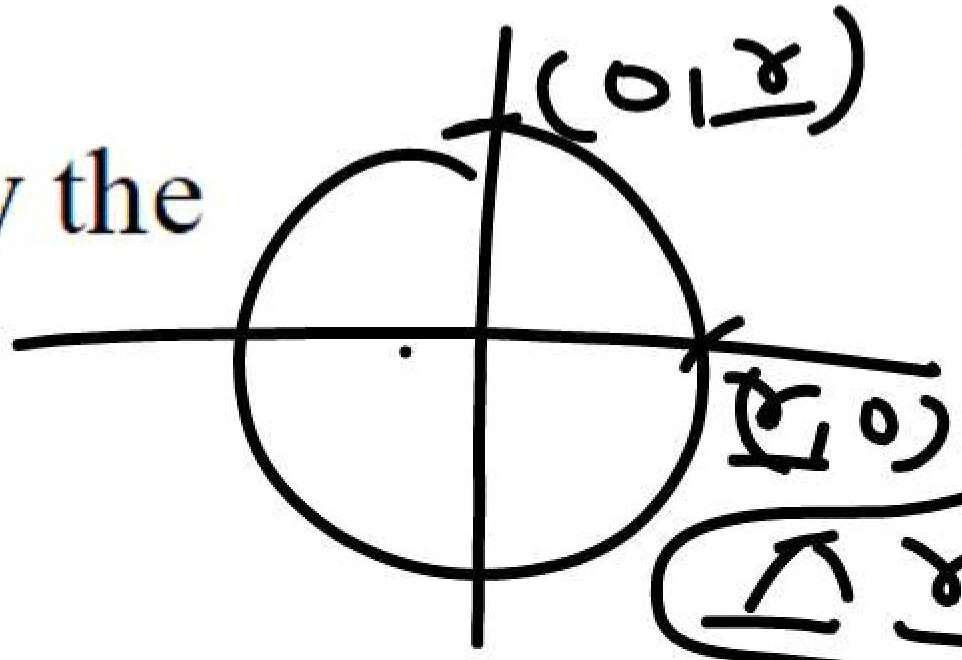
The area of the region bounded by the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$ is

(a) 12π

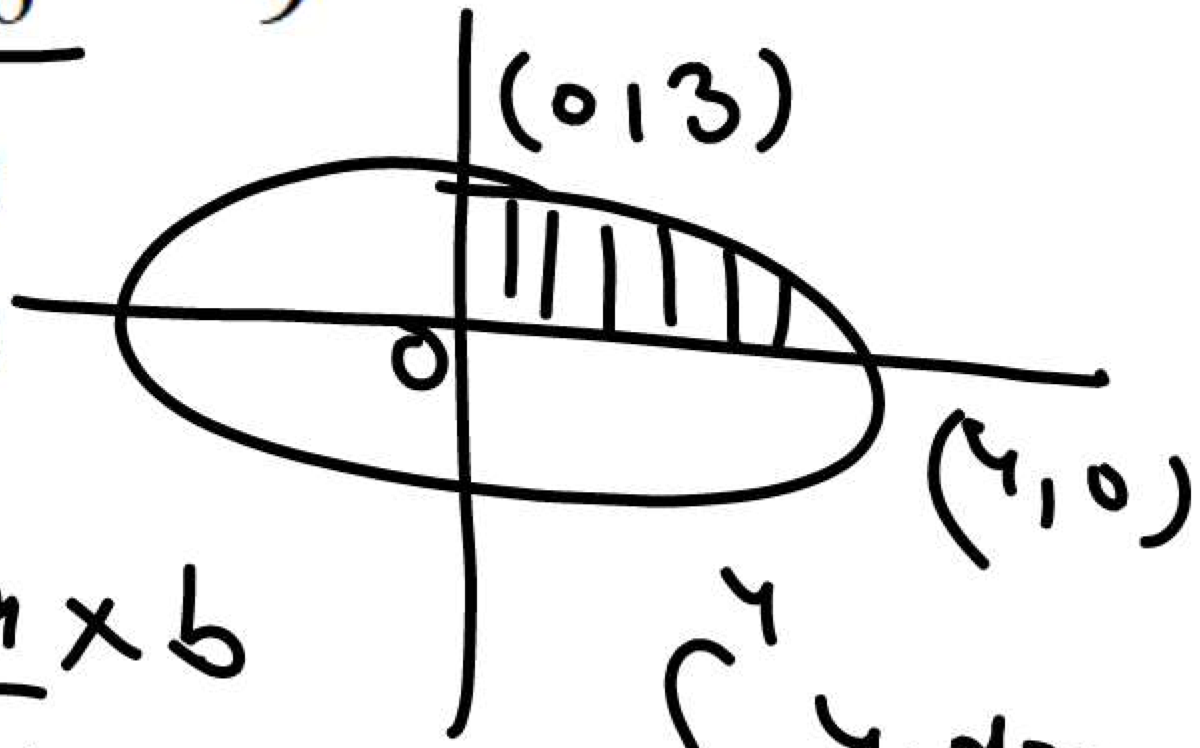
(b) 3π

(c) 24π

(d) π



πr^2



$\pi \times a \times b$

$4 \times 3 \times \pi$

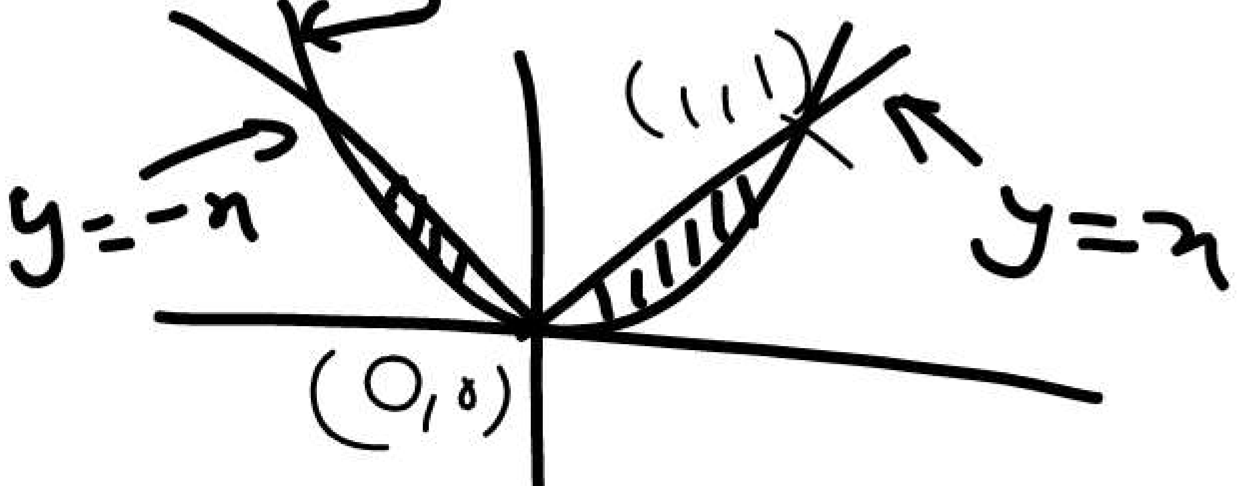
12π

$\int_0^4 y \cdot dx$

The area of the region bounded by the parabola $y = x^2$ and $y = |x|$ is

$y = x$

$$\left[\frac{x^2}{2} - \frac{x^3}{3}\right]_0^1$$



(a) 3

(b) $\frac{1}{2}$

$$\frac{1}{2} - \frac{1}{3} = \frac{3-2}{6}$$

(c) $\frac{1}{3}$

(d) 2

$$2\left[\int_0^1 x \cdot dx - \int_0^1 x^2 \cdot dx\right]$$

$$2 \times \frac{1}{6}$$

$$\frac{1}{3}$$