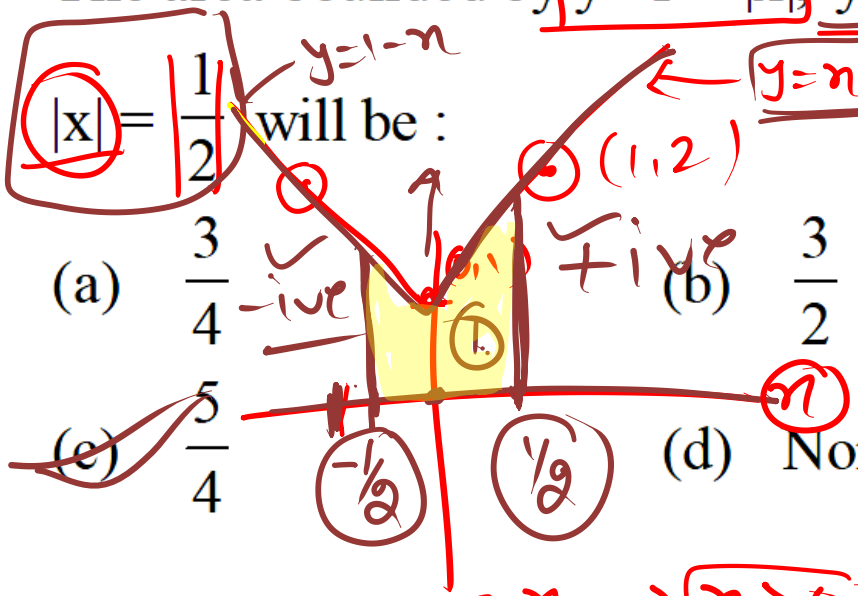
The area bounded by $y - 1 = |x|$, $y = 0$ and $|x| = \left|\frac{1}{2}\right|$ will be :



(a) $\frac{3}{4}$ (b) $\frac{3}{2}$

(c) $\frac{5}{4}$ (d) None of these

$|x| = \frac{1}{2} \Rightarrow x = \frac{1}{2}, -\frac{1}{2}$

$y - 1 = |x| \Rightarrow x \to x > 0$, $-x \to x < 0$

$y - 1 = x \Rightarrow y = x + 1$

x	0	1
y	1	2

$y - 1 = -x \Rightarrow y = 1 - x$

x	0	-1
y	1	2

$$\text{Area} = \int_0^{1/2} (x+1)\,dx$$

$$= 2\left[\frac{x^2}{2} + x\right]_0^{1/2}$$

$$\Rightarrow 2\left[\left(\frac{1}{2}\right)^2 \times \frac{1}{2} + \frac{1}{2}\right]$$

$$= 2 \times \left[\frac{1}{4} \cdot \frac{1}{2} + \frac{1}{2}\right]$$

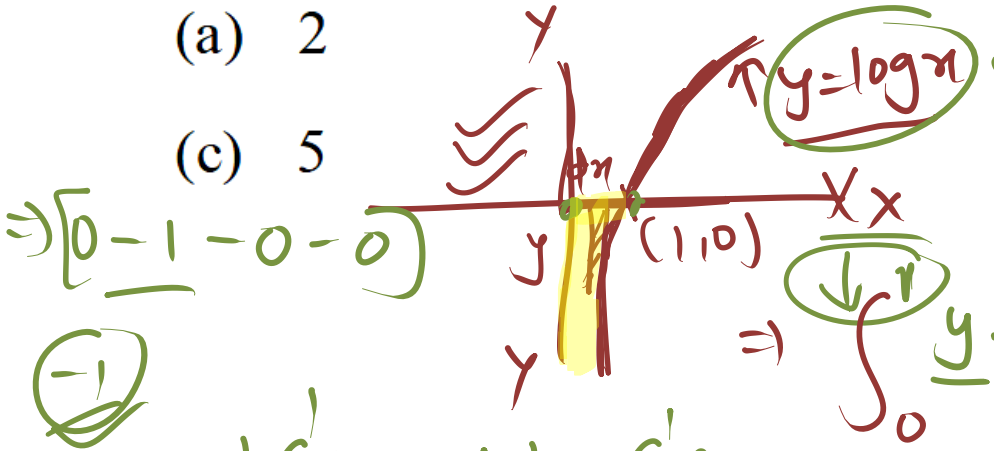
$$2 \times \left[\frac{1+4}{8}\right]$$

$$2 \times \frac{5}{8} = \frac{5}{4}$$

Area bounded by the curve $y = \log x$ and the coordinate axes is

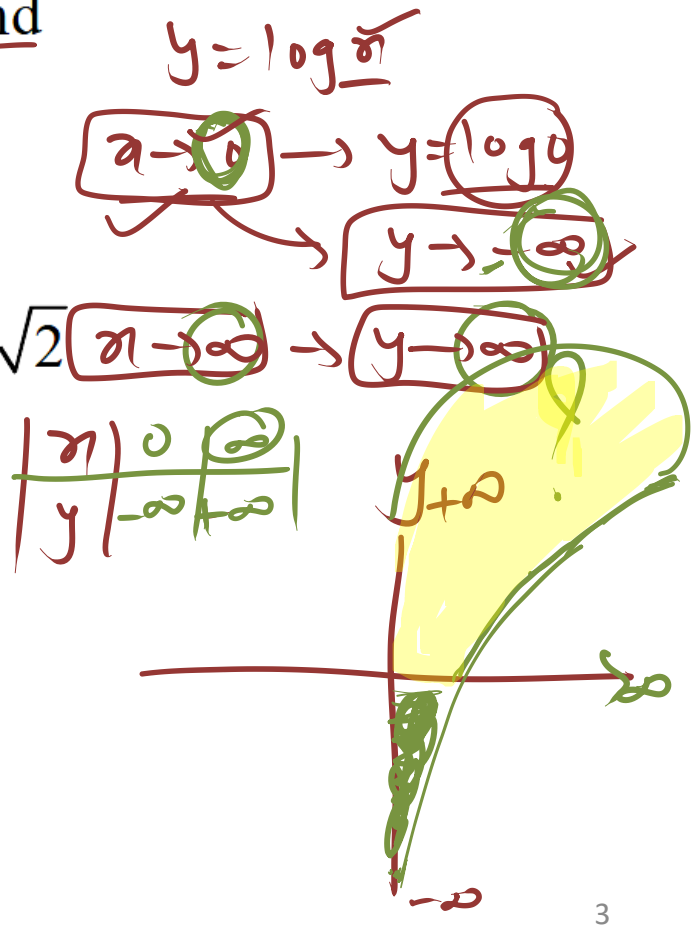
(a) 2 (b) 1

(c) 5 (d) $2\sqrt{2}$



$$\left|\int_0^1 \log x \, dx\right| = \int_0^1 \log x \cdot 1 \cdot dx$$

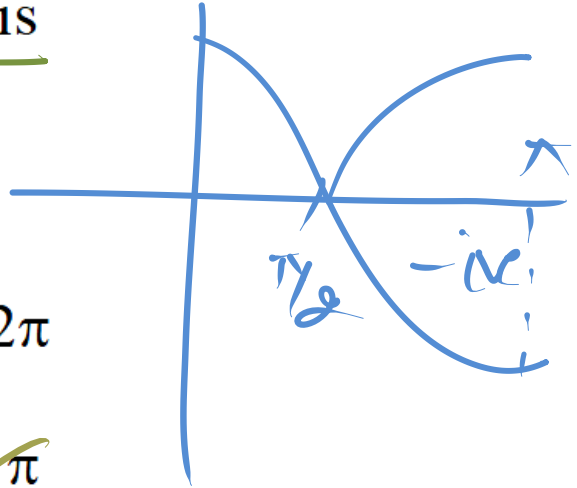
$$\left|\left[\log x \cdot x - \int \frac{1}{x} \cdot x \cdot dx\right]_0^1\right| = \left|\left[\log x \cdot x - x\right]_0^1\right|$$



Area between the curve $y = \cos^2 x$, x-axis and ordinates $x = 0$ and $x = p$ in the interval $(0, p)$ is

(a) $\frac{2\pi}{3}$ (b) 2π

(c) π (d) $\frac{\pi}{2}$



$$2\times\int_0^{\pi/2} y\,dx = 2\int_0^{\pi/2}\cos^2 x\,dx = 2\int_0^{\pi/2}\frac{1+\cos 2x}{2}$$

$$2\times\frac{1}{2}\left[x+\frac{\sin 2x}{2}\right]_0^{\pi/2} = \frac{\pi}{2}+0-0+0 = \pi/2$$

Directions : Read the following statements and choose the correct option from the given below four options.

Consider the following statements

Statement I : The area bounded by the curve $y = \sin x$ between $x = 0$ and $x = 2p$ is 2 sq. units.

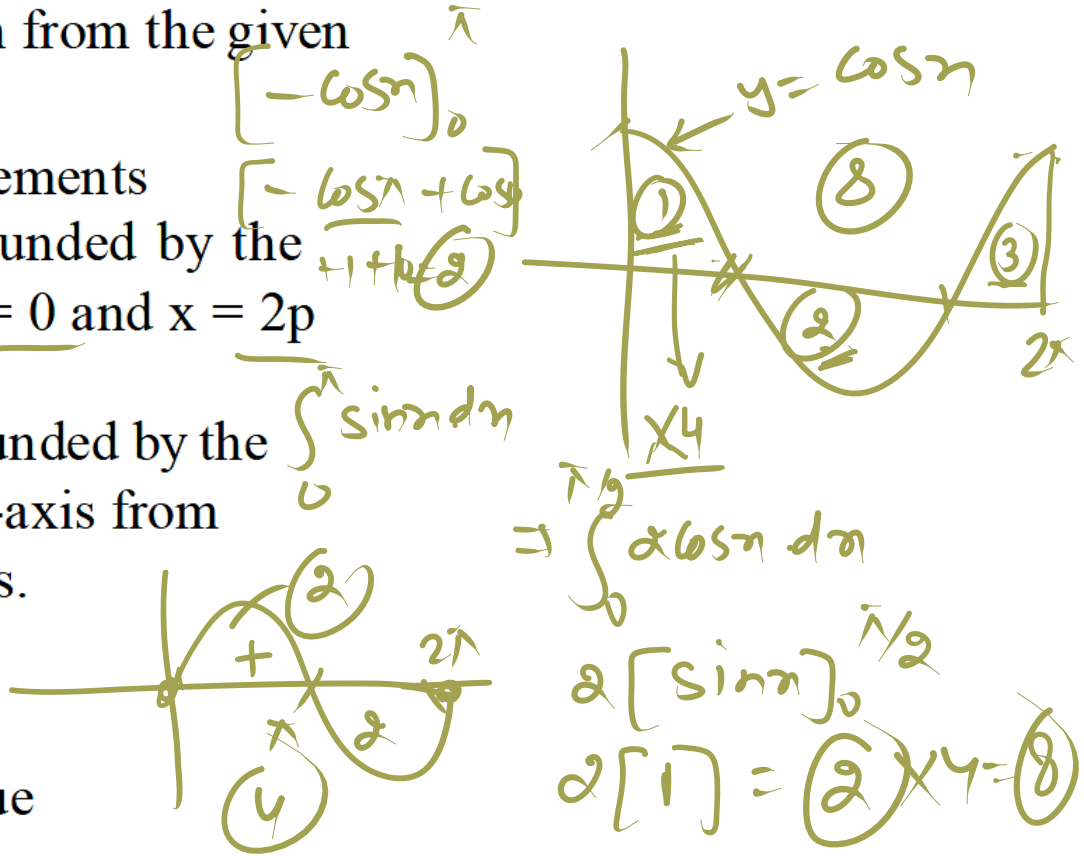
Statement II : The area bounded by the curve $y = 2 \cos x$ and the x-axis from $x = 0$ to $x = 2p$ is 8 sq. units.

(a) Statement I is true

(b) Statement II is true

(c) Both statements are true

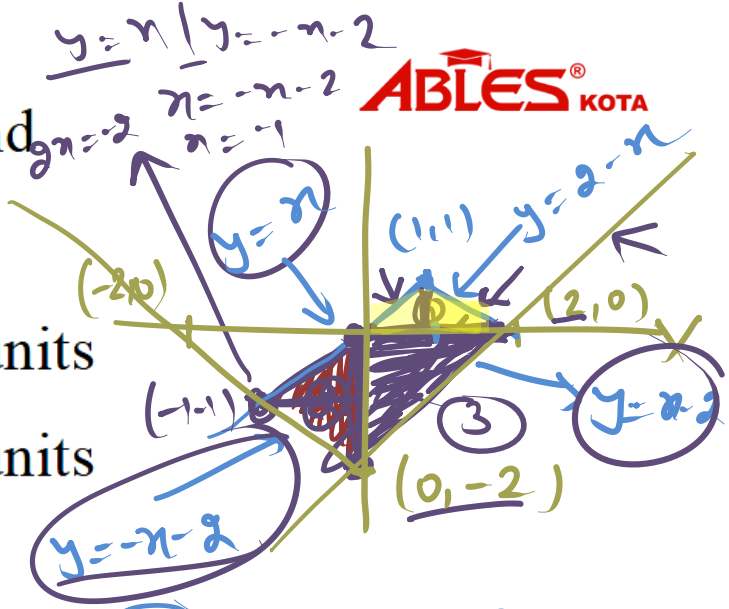
(d) Both statements are false



Area bounded by the lines $y = |x| - 2$ and $y = 1 - |x - 1|$ is equal to

(a) 4 sq. units (b) 6 sq. units

(c) 2 sq. units (d) 8 sq. units



$y = |x| - 2$

$y = x - 2 \rightarrow x \geq 0$

$y = -x - 2 \rightarrow x < 0$

$y = 1 - |x - 1|$

$y = 1 - (x - 1) = 2 - x$; $x > 1 \rightarrow y = 2 - x$

$y = 1 - [-(x - 1)] = x$; $x < +1$

① $\frac{1}{2} \times 2 \times 1 = 1$

② $\frac{1}{2} \times 2 \times 1 = 1$

③ $\frac{1}{2} \times 2 \times 2 = 2$

$\int_0^2 y \cdot dx$ $y = x$ $y = 2 - x$

$\int_2^0 y \cdot dx = \int_{-2}^{0} y \cdot dx + \int_{-1}^{0} y \cdot dx$

What is the area of the triangle bounded by the lines $y = 0$, $x + y = 0$ and $x = 4$?

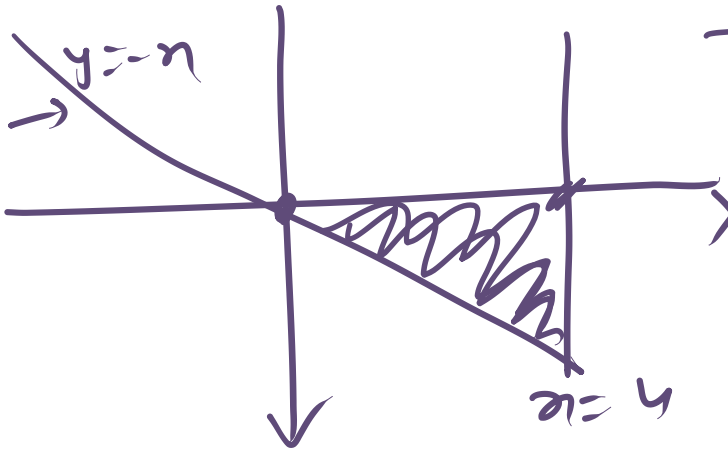
$x = -y$

(a) 4 units

(b) 8 units

(c) 12 units

(d) 16 units



$\rightarrow \left| \int_0^4 -x \cdot dx \right|$

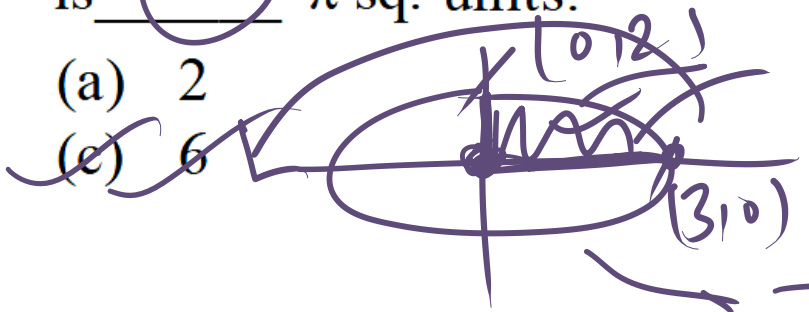
$X = \left[-\frac{x^2}{2} \right]_0^4$

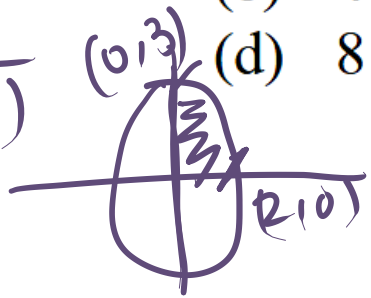
$-\frac{16}{2}$

The area of the ellipse $\frac{x^2}{9}+\frac{y^2}{4}=1$ in first quadrant is 6π sq. units. The ellipse is rotated about its centre in anti-clockwise direction till its major axis coincides with y-axis. Now the area of the ellipse in first quadrant is _____ π sq. units.

(a) 2 (b) 4

(c) 6 (d) 8

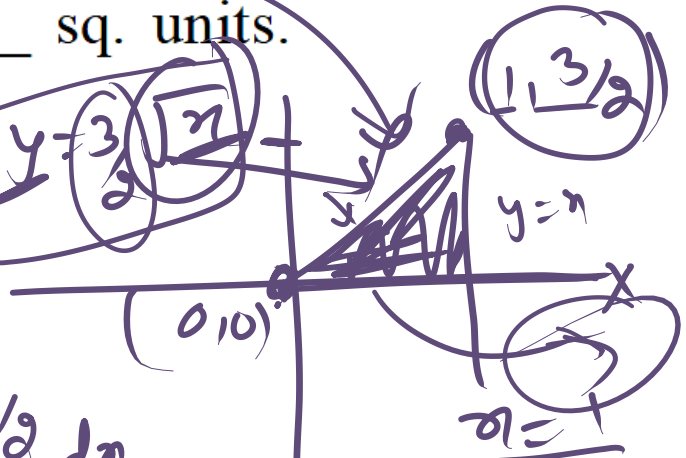


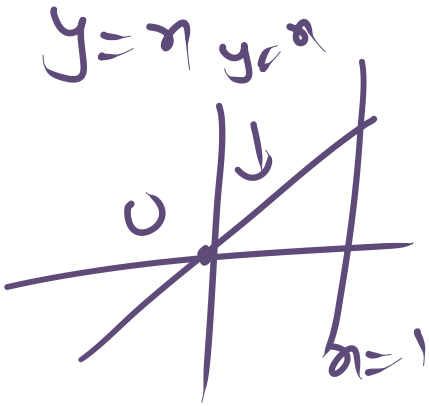


The area bounded by the curve $y = \frac{3}{2}\sqrt{x}$, the line $x = 1$ and x-axis is _____ sq. units.

(a) 2 (b) 4

(c) 6 (d) 8





Directions : This section contains multiple choice questions. Each question has four choices (a), (b), (c) and (d), out of which only one is correct.

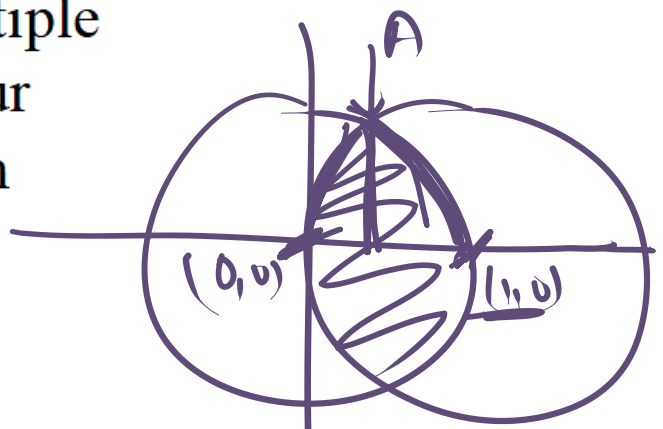
The area bounded by curves $(x-1)^2 + y^2 = 1$ and $x^2 + y^2 = 1$ is

(a) $\left(\frac{2\pi}{3} - \frac{\sqrt{3}}{2}\right)$

(b) $\frac{2\pi}{3}$

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

(d) $\frac{2\pi}{3} + \frac{\sqrt{3}}{2}$



$$2\times\left[\int_0^{A} 1\cdot dx + \int_{A}^{1} 2\cdot dx\right]$$

Area of triangle whose two vertices formed from the x-axis and line $y = 3 - |x|$ is

(a) 9 sq. units (b) 9/4 sq. units

(c) 3 sq. units (d) None of these

$$\int_0^3 y\,dx$$

$$2\int_0^3 (3-x)\,dx$$

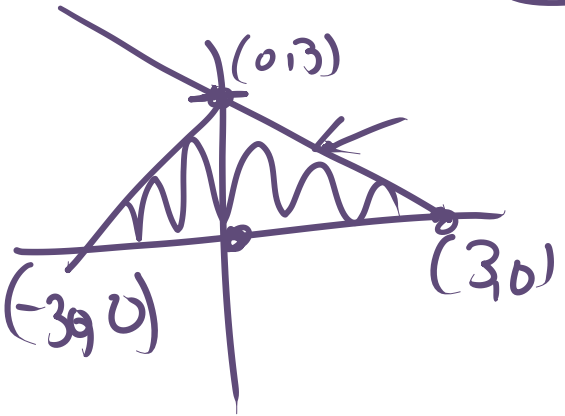
$y = 3 - |x|$

$y = 3 - x \rightarrow x \geq 0$

$y = 3 + x \rightarrow x < 0$

$\Rightarrow x = -3$

$y = 0$



1	2	3	4	5	6	7	8	9	10
C	B	D	B	A	B	B	B	A	D