

change the order of integration and evaluate.

$$I = \int_{x=0}^{x=5} \int_{y=2-x}^{y=2+x} dy dx$$

$$x=0 \quad y=2+x \quad \boxed{y=x+2}$$

$$x=5 \quad y=2-x \quad \boxed{y=-x+2}$$

18:40

To identify Questions of double strip

Both terms of inner integral will contain x/y
usually only one term contained that...

$$y = x$$



$$y = x + 2$$



$$y = -x$$



$$y = -x + 2$$



$$I = \int_{x=0}^{x=5} \int_{y=2-x}^{y=2+x} dy dx$$

$$x=0 \quad y=2+x \quad \boxed{y=x+2}$$

$$5 \quad y=2-x \quad \boxed{y=-x+2}$$

Find $A = (?)$

$$x=5 \text{ \& } y=x+2$$

$$y=5+2$$

$$y=7$$

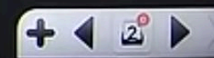
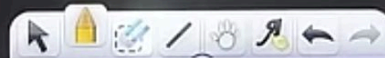
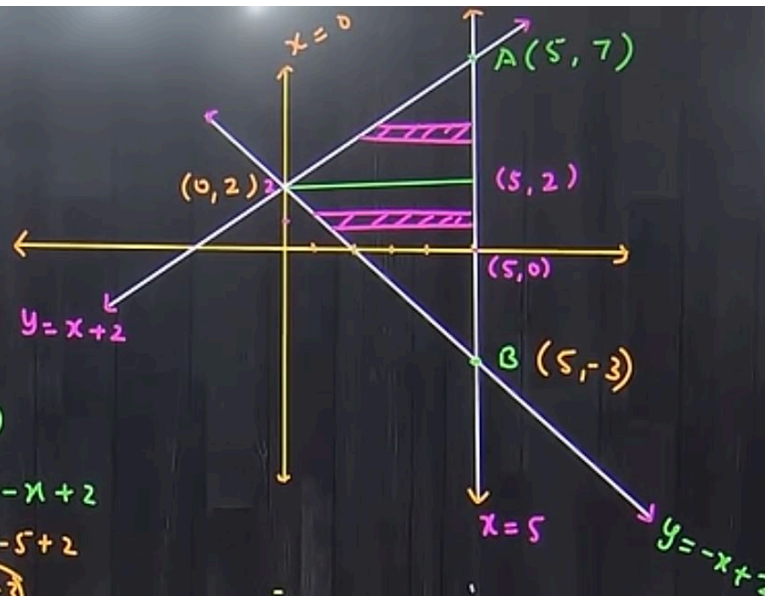
$B = (?)$

$$x=5 \text{ \& } y=-x+2$$

$$y=-5+2$$

$$y=-3$$

$$(5, -3)$$



First always solve lower
strip

$$I = \int_{x=0}^{x=5} \int_{y=2-x}^{y=2+x} dy dx$$

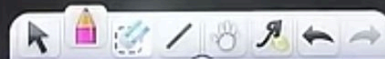
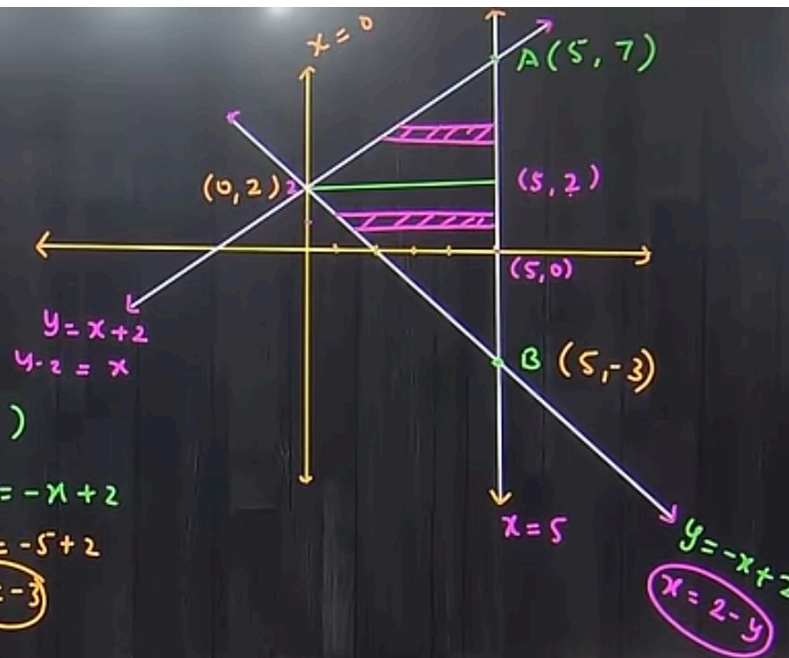
$$y = x + 2$$

$$y = -x + 2$$

and $A \equiv (?)$
 $x = 5$ & $y = x + 2$
 $y = 5 + 2$
 $y = 7$

$B \equiv (?)$
 $x = 5$ & $y = -x + 2$
 $y = -5 + 2$
 $y = -3$
 $(5, -3)$

$$= \int_{-3}^2 \int_{2-y}^5 dx dy + \int_2^7 \int_{y-2}^5 dx dy$$



$$I = \int_{x=0}^{x=5} \int_{y=2-x}^{y=2+x} dy dx$$

$$x=0 \quad y=2+x \quad \boxed{y=x+2}$$

$$x=5 \quad y=2-x \quad \boxed{y=-x+2}$$

Find $A \equiv (?)$

$$x=5 \text{ \& } y=x+2$$

$$y=5+2$$

$$y=7$$

$$= \int_{-3}^2 \int_{2-x}^5 dx dy + \int_2^7 \int_{x-2}^5 dx dy$$

$B \equiv (?)$

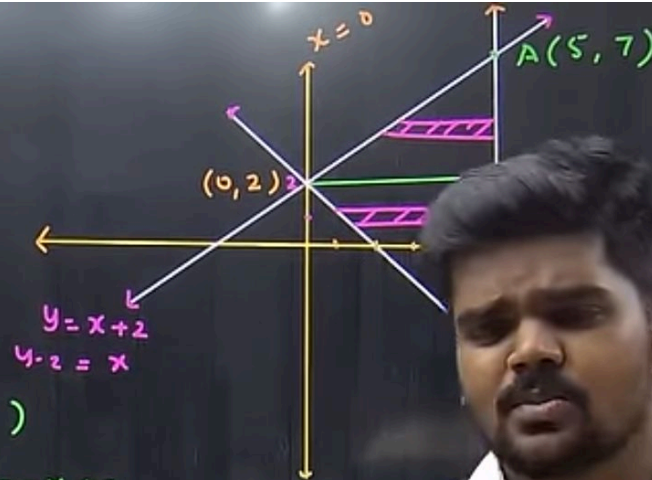
$$x=5 \text{ \& } y=-x+2$$

$$y=-5+2$$

$$y=-3$$

$$(5, -3)$$

$$= \int_{-3}^2 \int_{x-2}^5 dx dy + \int_2^7 \int_{x-2}^5 dx dy$$



Find $A \equiv (?)$

$$\boxed{x=5} \text{ \& } y=x+2$$

$$y=5+2$$

$$\boxed{y=7}$$

 $B \equiv (?)$

$$x=5 \text{ \& } y=-x+2$$

$$y=-5+2$$

$$\boxed{y=-3}$$

$$(5, -3)$$

$$= \int_{-3}^2 \left[\int_{2-y}^5 dx \right] dy + \int_2^7 \left[\int_{y-2}^5 dx \right] dy$$

$$= \int_{-3}^2 \left[x \right]_{2-y}^5 dy + \int_2^7 \left[x \right]_{y-2}^5 dy$$

$$= \int_{-3}^2 [5 - (2-y)] dy + \int_2^7 [5 - (y-2)] dy$$

$$B(5, -3)$$

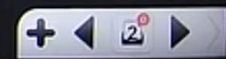
$$x=5$$

$$y=-x+2$$

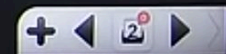
$$\boxed{x=2-y}$$

18:57

$$\begin{aligned}&= \int_{-3}^2 \int_{2-y}^x x \, dy + \int_2^7 \int_{y-2}^x x \, dy \\&= \int_{-3}^2 [5 - (2-y)] \, dy + \int_2^7 [5 - (y-2)] \, dy \\&= \int_{-3}^2 [3-y] \, dy + \int_2^7 [7-y] \, dy \\&= \left[3y - \frac{y^2}{2} \right]_{-3}^2 + \left[7y - \frac{y^2}{2} \right]_2^7\end{aligned}$$



$$\begin{aligned}
 &= \int_{-3}^2 [5 - (2 - y)] dy + \int_2^7 [5 - (y - 2)] dy \\
 &= \int_{-3}^2 [3 + y] dy + \int_2^7 [7 - y] dy \\
 &= \left[3y + \frac{y^2}{2} \right]_{-3}^2 + \left[7y - \frac{y^2}{2} \right]_2^7 \\
 &= \left[6 + \frac{4}{2} - \left(-9 + \frac{9}{2} \right) \right] + \left[49 - \frac{49}{2} - \left(14 - \frac{4}{2} \right) \right] \\
 &= \left[6 - 2 + 9 + \frac{9}{2} \right] +
 \end{aligned}$$



19:02

$$= \left[6 + \frac{4}{2} - \left(-9 + \frac{9}{2} \right) \right] + \left[49 - \frac{49}{2} - \left(14 - \frac{4}{2} \right) \right]$$

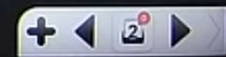
$$= \left[\underline{6+2+9} - \frac{9}{2} \right] + \left[49 - \frac{49}{2} - \underline{14+2} \right]$$

$$= \left[17 - \frac{9}{2} \right] + \left[37 - \frac{49}{2} \right]$$

$$= \left[\frac{34-9}{2} \right] + \left[\frac{74-49}{2} \right]$$

$$\begin{array}{r} 37 \\ \times 2 \\ \hline 74 \\ 49 - 12 \\ \hline \end{array}$$

(37)



19:02

$$= \left[6 + \frac{4}{2} - \left(-9 + \frac{9}{2} \right) \right] + \left[49 - \frac{49}{2} - \left(14 - \frac{4}{2} \right) \right]$$

$$= \left[\underline{6+2+9} - \frac{9}{2} \right] + \left[49 - \frac{49}{2} - \underline{14+2} \right]$$

$$\frac{9}{2} \left] + \left[37 - \frac{49}{2} \right]$$

$$= \left[\frac{-9}{2} \right] + \left[\frac{74-49}{2} \right]$$

$$= \frac{\textcircled{25}}{2} + \frac{\textcircled{25}}{2}$$

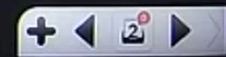
$$= \frac{50}{2}$$

$$= 25 //$$

$$\begin{array}{r} 37 \\ \times 2 \\ \hline 74 \\ 49 - 12 \end{array}$$

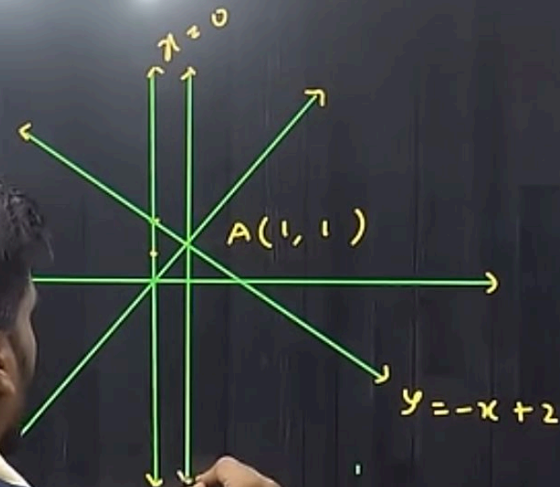
$$\textcircled{37}$$

$$\begin{array}{r} 74 \\ - 49 \\ \hline 25 \end{array}$$

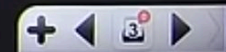


$$\int_{x=0}^1 \int_{y=x}^{y=2-x} \frac{x}{y} dy dx$$

$$\begin{aligned} x=0 \\ x=1 \end{aligned} \quad \begin{aligned} y=x \checkmark \\ y=2-x \checkmark \\ y=-x+2 \end{aligned}$$



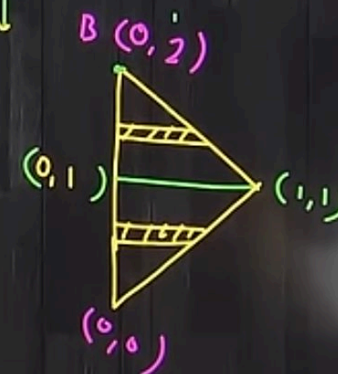
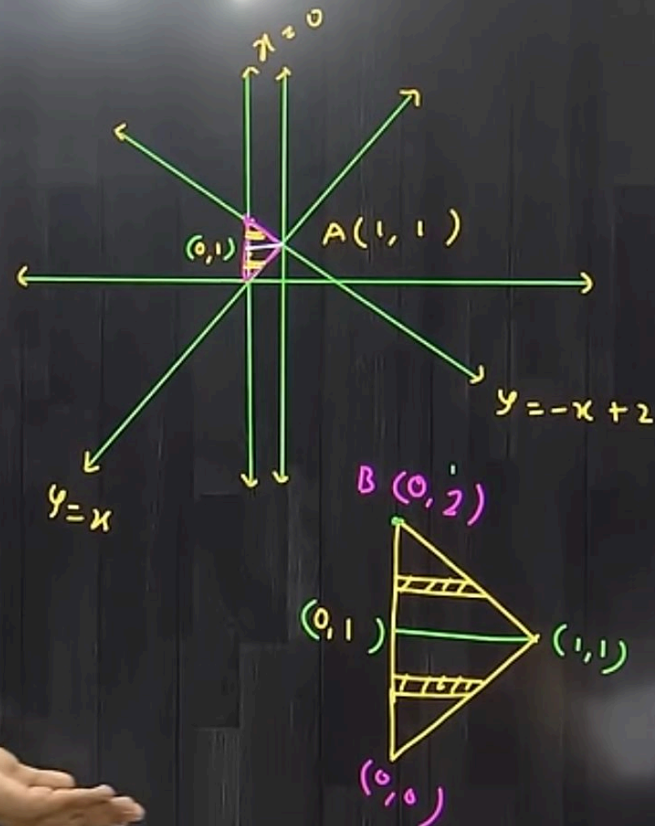
19:07



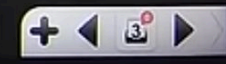
$$\int_{x=0}^1 \int_{y=x}^{y=2-x} \frac{x}{y} dy dx$$

$$\begin{aligned} x=0 \\ x=1 \end{aligned} \quad \begin{aligned} y=x \\ y=2-x \end{aligned}$$

y



19:10



$$x=1 \quad y=2-x$$

$$= \int_0^1 \int_x^{2-x} \frac{x}{y} dy dx$$

$$y=x \quad \checkmark$$

$$y=2-x \quad \checkmark$$

$$y = -x + 2$$

$$= \int_0^1 \int_0^y \frac{x}{y} dx dy + \int_1^2 \int_0^{2-y} \frac{x}{y} dx dy$$

$$\int_0^{2-y} \frac{x}{y} dx dy$$

