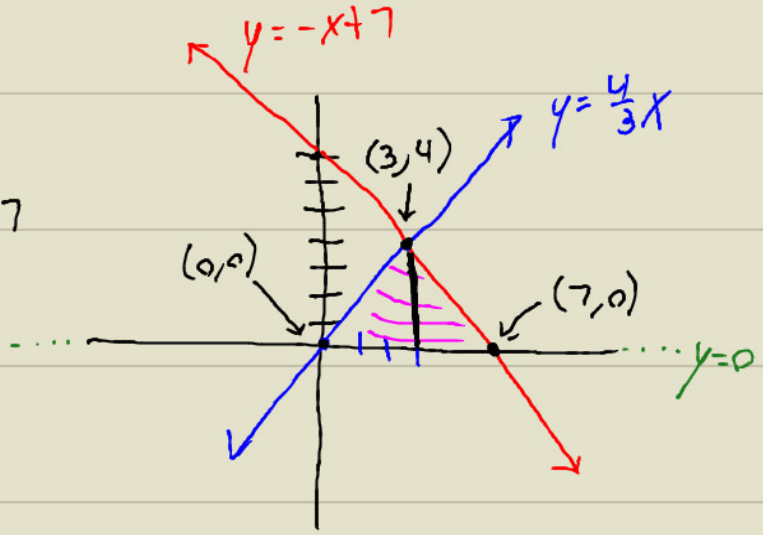
10. $4x-3y=0$ $\quad x+y=7$ $\quad y=0$

$4x=3y$ $\quad y=-x+7$

$\frac{4}{3}x=y$



PoI of $y=-x+7$ AND $y=\frac{4}{3}x$

$-x+7=\frac{4}{3}x$

$-3x+21=4x$

$21=4x+3x$

$21=7x$

$3=x$

PoI of $y=-x+7$ AND $y=0$

$-x+7=0$

$7=x$

$$\int_{x=0}^{x=3}\int_{y=0}^{y=\frac{4}{3}x} dy\,dx + \int_{x=3}^{x=7}\int_{y=0}^{y=-x+7} dy\,dx$$

$$= \int_{x=0}^{x=3}\left[y\right]_{y=0}^{y=\frac{4}{3}x} dx + \int_{x=3}^{x=7}\left[y\right]_{y=0}^{y=-x+7} dx$$

$$= \int_{x=0}^{x=3}\left(\frac{4}{3}x-0\right)dx + \int_{x=3}^{x=7}\left(-x+7-0\right)dx$$

$$= \frac{4}{3}\left[\frac{1}{2}x^2\right]_{x=0}^{x=3} + \left[-\frac{1}{2}x^2+7x\right]_{x=3}^{x=7}$$

$$= \frac{4}{3}\cdot\frac{1}{2}\left(3^2-0^2\right) + \left[-\frac{1}{2}(7)^2+7(7)-\left(-\frac{1}{2}(3)^2+7(3)\right)\right]$$

$$= \frac{2}{3}(9) - \frac{49}{2} + 49 - \left(-\frac{9}{2}+21\right)$$

$$= 6 - \frac{49}{2} + 49 + \frac{9}{2} - 21$$

$$= 34 - \frac{40}{2}$$

$$= 34 - 20$$

$$= \boxed{14}$$