Sometimes horizontal rectangles are a better option...

Example:

Determine the area of the region bound by the curves $x = y^2$ and $x = -2y^2 + 3$.

$y^2 = -2y^2 + 3$

$y^2 + 2y^2 - 3 = 0$

$3y^2 - 3 = 0$

$y^2 - 1 = 0$

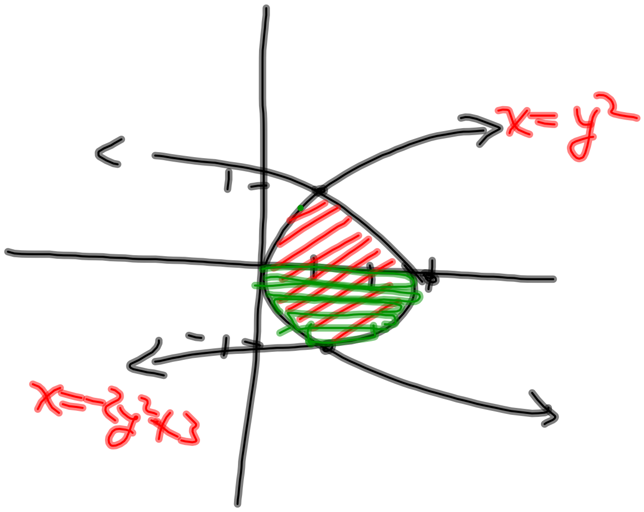
$(y-1)(y+1) = 0$

$y = \pm 1$

$y = 1 \qquad -1$

$x = 1 \qquad 1$

$(1,1) \qquad (1,-1)$



$$\int_{-1}^{1} \left[(-2y^2+3) - (y^2)\right] dy$$

$$\int_{-1}^{1} (-3y^2+3)\, dy$$

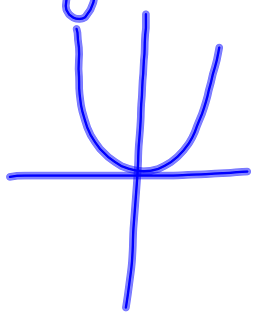
$$= -y^3 + 3y \Big|_{-1}^{1}$$

$$= (-1+3) - (1-3)$$

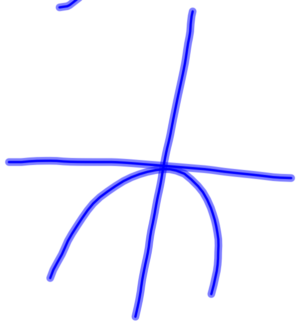
$$= 2 - (-2)$$

$$= \underline{4}$$

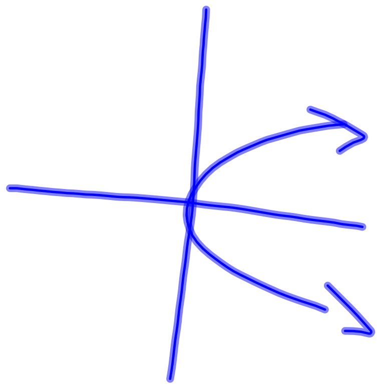
$y = x^2$



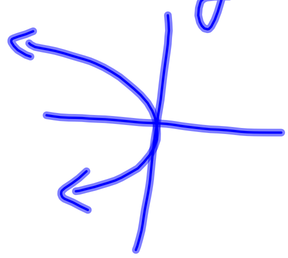
$y = -x^2$



$x = y^2$



$x = -y^2$



Determine the area bounded by the curves $x + 7 = y^2$ and $y = x + 1$.

$x = y^2 - 7 \qquad x = y - 1$

$y^2 - 7 = y - 1$

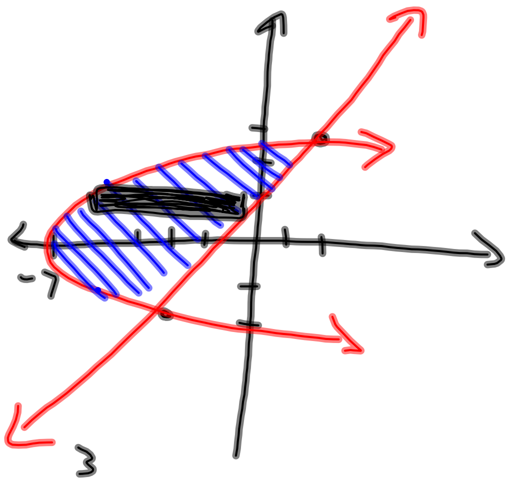
$y^2 - y - 6 = 0$

$(y-3)(y+2) = 0$

$y = 3, -2$

$y = 3 \quad y = -2$

$x = 2 \quad x = -3$



$$\int_{-2}^{3} \left[(y-1) - (y^2 - 7)\right] dy$$

$$\int_{-2}^{3} (-y^2 + y + 6)\, dy$$

$$= -\frac{y^3}{3} + \frac{y^2}{2} + 6y \Big|_{-2}^{3}$$

$$= \left(-9 + \frac{9}{2} + 18\right) - \left(\frac{8}{3} + 2 - 12\right)$$

$$= 9 + \frac{9}{2} - \frac{8}{3} + 10$$

$$= \frac{19}{1} + \frac{9}{2} - \frac{8}{3}$$

$$= \frac{114 + 27 - 16}{6}$$

$$= \frac{125}{6} u^2$$