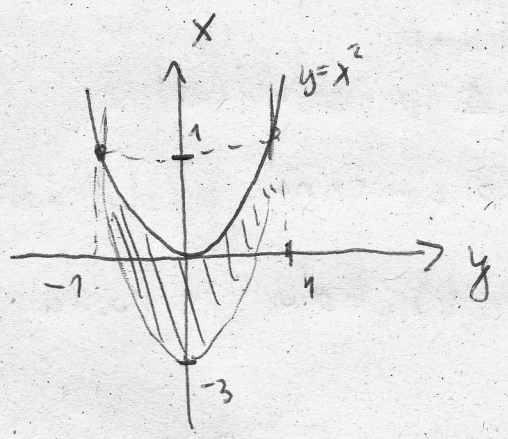
Cvičení 6.

Př. 7. Určete obsah množiny A ohraničené plochami:
$x = y^2$; $x = 4y^2 - 3$.



$4y^2 - 3 = y^2$

$3y^2 - 3 = 0$

$3 \cdot (y-1)(y+1) = 0$

$y = 1 \wedge y = -1$

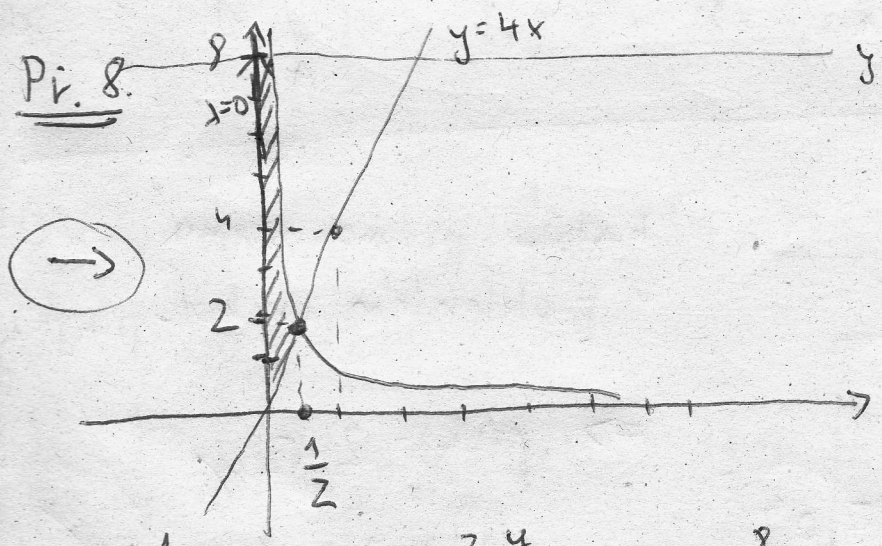
$\Rightarrow x = 4y^2 - 3 \overset{y=1}{\Rightarrow} x = 1$

$\overset{y=-1}{\Rightarrow} x = 1$

$$\int_{-1}^{1}\int_{4y^2-3}^{y^2} dx\,dy = \int_{-1}^{1} [y^2 - 4y^2 + 3]\,dy = \int_{-1}^{1} [-3y^2 + 3]\,dy =$$

$$= [-y^3 + 3y]_{-1}^{1} = (-1+3) - (+1-3) = 6 - 2 = \underline{4};$$

Př. 8. Určete obsah:



$\frac{1}{x} = 4x$

$\frac{1}{4} = x^2$

$x = \pm\frac{1}{2} \Rightarrow y = 2$

$$\int_{2}^{8}\int_{0}^{\frac{1}{y}} dx\,dy + \int_{0}^{2}\int_{0}^{\frac{y}{4}} dx\,dy = \int_{2}^{8} \left[\frac{1}{y}\right] dy + \int_{0}^{2} \frac{y}{4}\,dy =$$