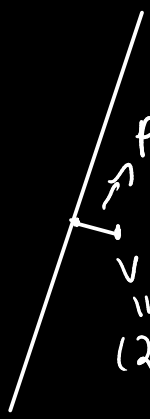
(1) Dê a equação da parábola de vértice $(2,1)$ e diretriz $4x+3y=1$.

$4x+3y-1=0$



$\boxed{F = V + \vec{v}\cdot p}$, onde $\|\vec{v}\| = 1$.

Sei q $\vec{n}$ de r é $\vec{n} = (4,3)$

$\boxed{\frac{\vec{n}}{\|n\|} = \vec{v}}$

$\|n\| = \sqrt{4^2+3^2} = 5$

$\vec{v} = \left(\frac{4}{5}, \frac{3}{5}\right)$

$p = d(V,r) = \frac{|4\cdot 2 + 3\cdot 1 - 1|}{\sqrt{4^2+3^2}} = 2$

$F = \overbrace{(2,1)}^{V} + 2\cdot\left(\frac{4}{5}, \frac{3}{5}\right) = \left(2+\frac{8}{5}, 1+\frac{6}{5}\right)$

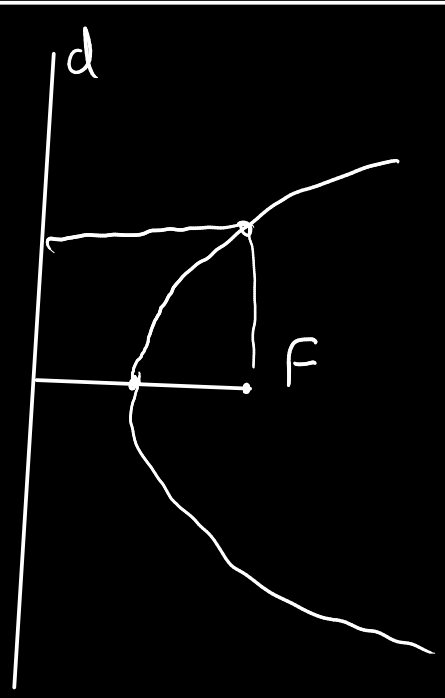
$= \left(\frac{18}{5}, \frac{11}{5}\right) = F$

escrevendo a parábola

$d(\hat{P}, F) = d(\hat{P}, r)$

$\hat{P} = (x,y)$, $d(\hat{P}, r) = \frac{|4x+3y-1|}{5} = \sqrt{\left(x-\frac{18}{5}\right)^2 + \left(y-\frac{11}{5}\right)^2}$

$4x+3y-1 = 25\left[\left(x-\frac{18}{5}\right)^2+\left(y-\frac{11}{5}\right)^2\right]$ (faça as contas)



$\mathbb{R}^2$