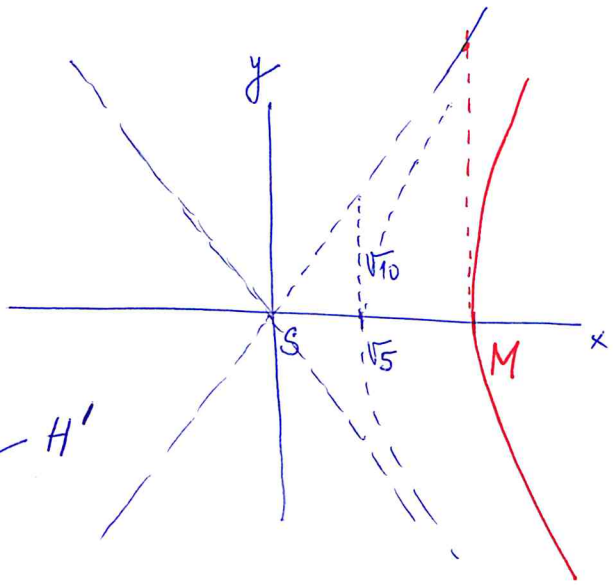
Cvičení 6



1. $H: \frac{x^2}{5} - \frac{y^2}{10} = 1$

$a = \sqrt{5}$, $b = \sqrt{10}$

M je vrchol nové hyperboly H'

H': $a' = 10$, $b' = ?$; $S = S'$

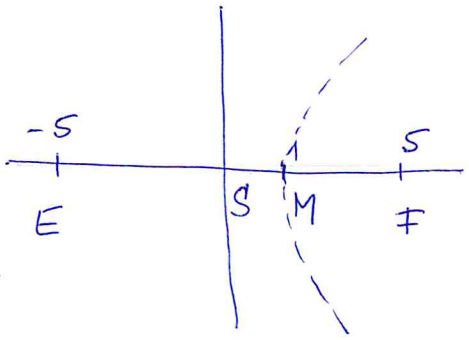
nyní asymptoty $\Rightarrow \frac{b}{a} = \frac{b'}{a'} \Rightarrow \frac{\sqrt{10}}{\sqrt{5}} = \frac{b'}{10} \Rightarrow$

$\Rightarrow \frac{\sqrt{50}}{5} = \frac{b'}{10} \Rightarrow \frac{2\sqrt{50}}{10} = \frac{b'}{10} \Rightarrow b' = 2\sqrt{50} = 10\sqrt{2}$

H': $\frac{x^2}{100} - \frac{y^2}{200} = 1$

2. M musí být vrchol

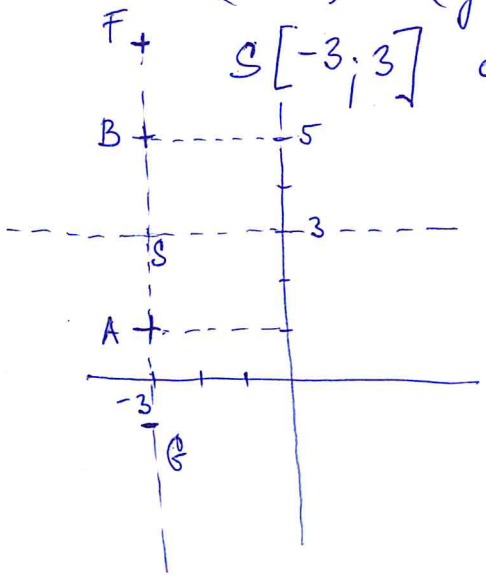
$a = 1$, $e = 5 \rightarrow b = \sqrt{5^2 - 1^2} = \sqrt{24}$



$H: \frac{x^2}{1} - \frac{y^2}{24} = 1$

3. $x^2 + 6x + 9 - 9 - (y^2 - 6y + 9) + 9 + 4 = 0$

$(x+3)^2 - (y-3)^2 = -4 \rightarrow -\frac{(x+3)^2}{4} + \frac{(y-3)^2}{4} = 1$



$S[-3; 3]$ $a = b = 2 \rightarrow e = 2\sqrt{2}$

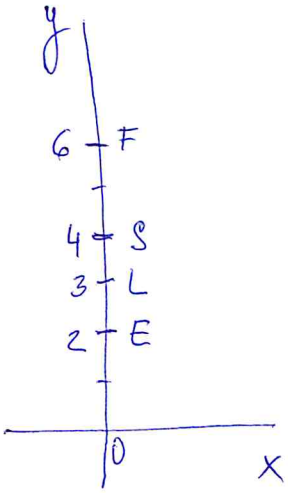
$A[-3; 1]$ $B[-3; 5]$, $F[-3; 3+2\sqrt{2}]$

$G[-3; 3-2\sqrt{2}]$

4. $S[0;4]$, $e=2$, $L[0;3]$ – vrchol

$\Rightarrow a=1 \Rightarrow b=\sqrt{2^2-1^2}=\sqrt{3}$

$H: \quad -\frac{x^2}{3}+\frac{(y-4)^2}{1}=1$



6. priesečník: $x^2-(x\sqrt{2}+q)^2-25=0 \rightarrow$

$x^2-(2x^2+2\sqrt{2}qx+q^2)-25=0$

$-x^2-2\sqrt{2}qx-q^2-25=0 \rightarrow$

$x^2+2\sqrt{2}q\cdot x+q^2+25=0 \rightarrow$ kvadr. rce s koef.

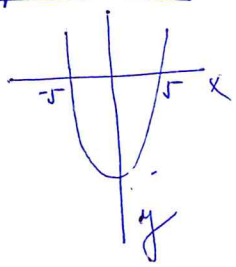
$a=1,\ b=2\sqrt{2}q,\ c=q^2+25$

$D=(2\sqrt{2}q)^2-4\cdot 1\cdot(q^2+25)=8q^2-4q^2-100=4q^2-100$

$D=0 \Rightarrow$ **1 spol. b.**: $4q^2-100=0 \rightarrow q^2=25 \rightarrow q=\pm 5$

$D>0 \Rightarrow$ **rôzne 2 b.** $\quad q\in(-\infty;-5)\cup(5;\infty)$

$D<0 \Rightarrow$ **ϕ spol. b.** $\quad q\in(-5;5)$



7. $t: \quad (x-4)(2-4)-\frac{1}{3}(y-3)(6-3)-1=0$

$-2x+8-y+3-1=0 \rightarrow$ **$y=-2x+10$**