14. příklad

Určete supremum a infimum množiny:

a) $M_1 = \left\{ x \in \mathbb{R};\ 1 < \frac{1}{x+2} \leq 3 \right\} = \left(-\frac{5}{3}, -1 \right)$

průsečíky hyperboly a přímek:

I. $\frac{1}{x+2} = 3$

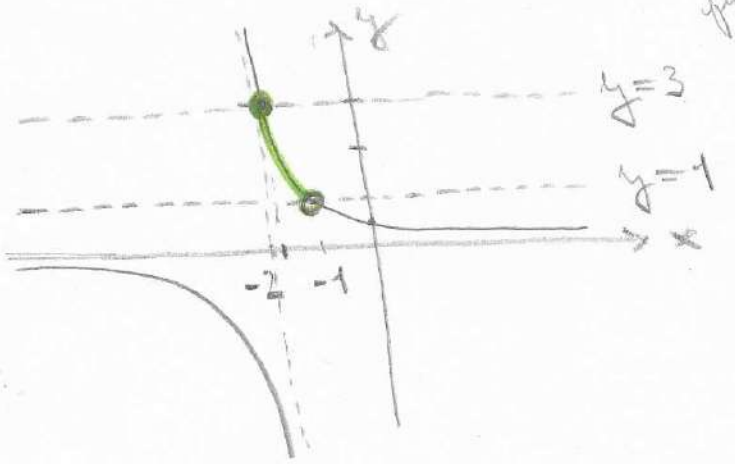
$\frac{1}{3} = x+2$

$x = -\frac{5}{3}$

II. $\frac{1}{x+2} = 1$

$1 = x+2$

$x = -1$



$\sup M_1 = -1$

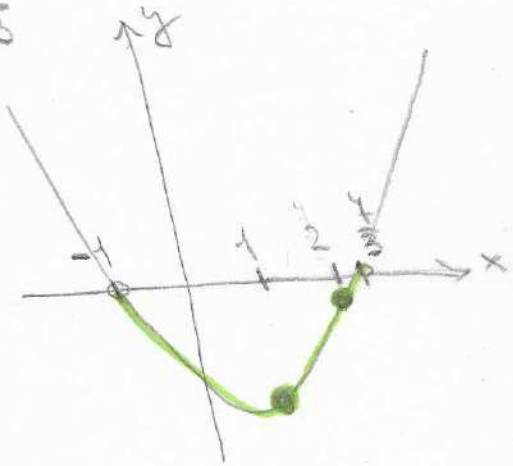
$\inf M_1 = -\frac{5}{3}$

b) $M_2 = \left\{ 3n^2 - 4n - 7 \leq 0,\ n \in \mathbb{N} \right\} = \{1; 2\}$

$f(x) := 3x^2 - 4x - 7 = 3 \cdot (x+1)\left(x - \frac{7}{3}\right) \leq 0 \iff x \in \left\langle -1, \frac{7}{3} \right\rangle$

$D = (-4)^2 - 4 \cdot 3 \cdot (-7) = 100$

$x_{1,2} = \frac{4 \pm \sqrt{100}}{6} = \frac{4 \pm 10}{6} = \begin{cases} \frac{14}{6} = \frac{7}{3} \\ -1 \end{cases}$



$\sup M_2 = 2$

$\inf M_2 = 1$