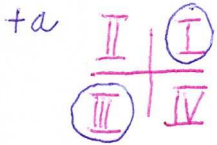


náčrtky

KVADRANTY



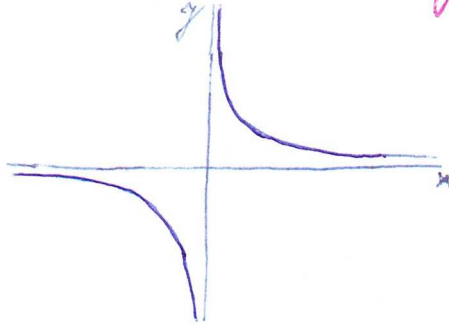
obecně $y = a \frac{1}{x+c} + b$



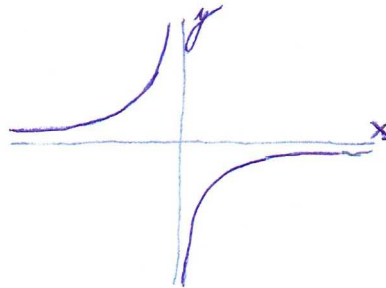
I $y = a \cdot \frac{1}{x}$

$0 < a < 1$ přibližuje se k osám
 $a > 1$ oddaluje se od os.

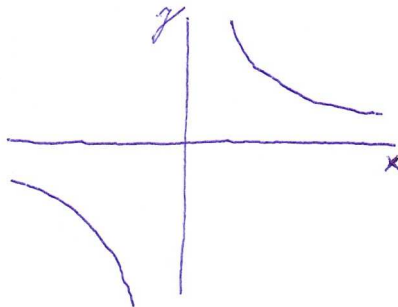
HYPERBOLA $y = \frac{1}{x}$



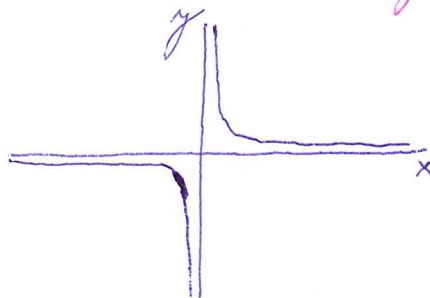
HYPERBOLA $y = -\frac{1}{x}$



HYPERBOLA $y = 2 \cdot \frac{1}{x}$



HYPERBOLA $y = \frac{1}{3} \cdot \frac{1}{x}$



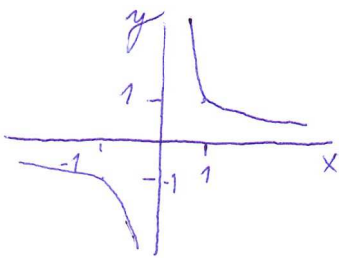
II

$$y = \frac{1}{x} + b$$

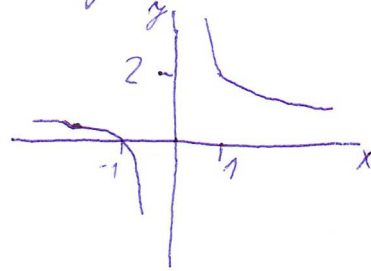
$b > 0$ POSOUVÁME NAHORU +

$b < 0$ POSOUVÁME DOLŮ -

$$y = \frac{1}{x} \text{ HYPERBOLA}$$



$$y = \frac{1}{x} + 1 \text{ HYPERBOLA}$$



III

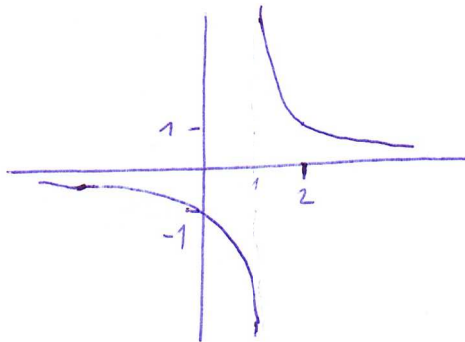
$$y = \frac{1}{x+c}$$

-c do prava

+c do leva

MĚNÍ SE DEFINIČNÍ OBOR

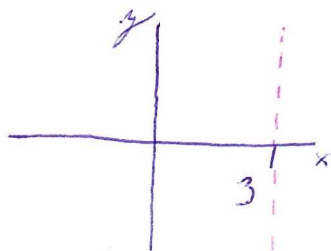
$$y = \frac{1}{x-1} \text{ HYPERBOLA}$$



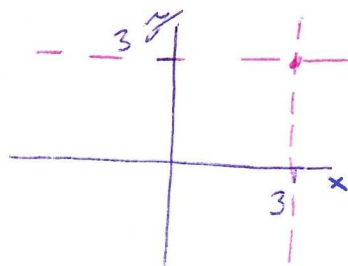
NAČRTNĚTE GRAFY LOMENÝCH FUNKCÍ

$$f: y = \frac{1}{x-3} + 3$$

1. Udělám první přerušovanou čáru, protože $x-3$ posune o 3 do prava.



2. Máme posunout o 3 nahoru, protože je zde $+3$, udělám přerušovanou čáru.



3. Nyní potřebuji zjistit průsečíky:

$$P_x = ? \quad y = 0$$

$$0 = \frac{1}{x-3} + 3$$

$$0 = \frac{1}{x-3} + \frac{3}{1}$$

$$0 = \frac{1+3(x-3)}{x-3} \quad | \cdot (x-3)$$

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

$$0 = 1+3x-9 \quad | -3x$$

$$-3x = -8 \quad | \cdot (-1)$$

$$3x = 8 \quad | :3$$

$$x = \frac{8}{3}$$

$$P_y = ? \quad x = 0$$

$$y = \frac{1}{0-3} + 3$$

$$y = \frac{1}{-3} + \frac{3}{1}$$

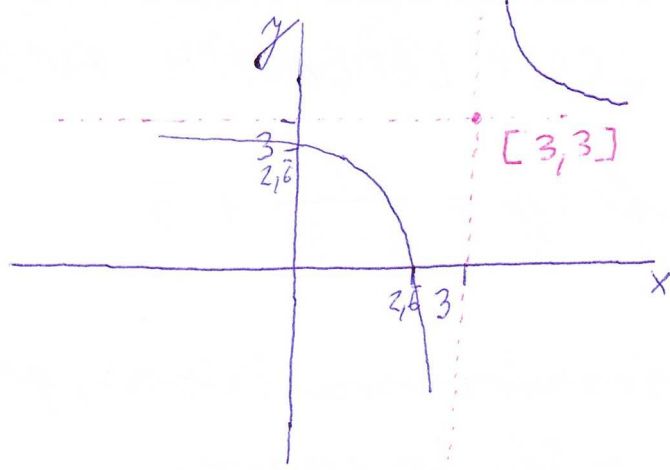
$$y = \frac{1-9}{-3}$$

$$y = \frac{-8}{-3} = \frac{8}{3}$$

$$P_y \left[0, \frac{8}{3} \right]$$

$$P_x \left[\frac{8}{3}, 0 \right]$$

nörd:



$$P_x \left[\frac{8}{3}, 0 \right]$$

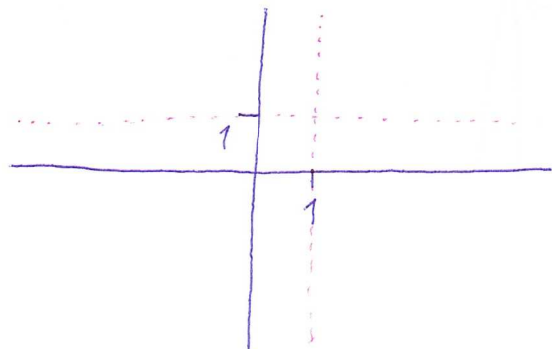
$$P_y \left[0, \frac{8}{3} \right]$$

NARÝSUJ GRAF FUNKCE

$$f: y = 2 \cdot \frac{1}{x-1} + 1$$

↳ Poznáte bod lesí na os x.

1. Udělat první přerušované čáry. ($x-1$ je posun do prava, $+1$ je posun nahoru)



2. Průsečíky?

$$P_x = ? \quad y = 0$$

$$0 = 2 \cdot \frac{1}{x-1} + 1$$

$$0 = \frac{2}{x-1} + \frac{1}{1}$$

$$0 = \frac{2+x-1}{x-1}$$

$$0 = \frac{x+1}{x-1} \quad | \cdot (x-1)$$

$$(x-1) \cdot 0 = x+1$$

$$0 = x+1 \quad | -x$$

$$-x = 1 \quad | \cdot (-1)$$

$$x = -1$$

$$P_x [-1, 0]$$

$$P_y = ? \quad x = 0$$

$$y = 2 \cdot \frac{1}{0-1} + 1$$

$$y = 2 \cdot (-1) + 1$$

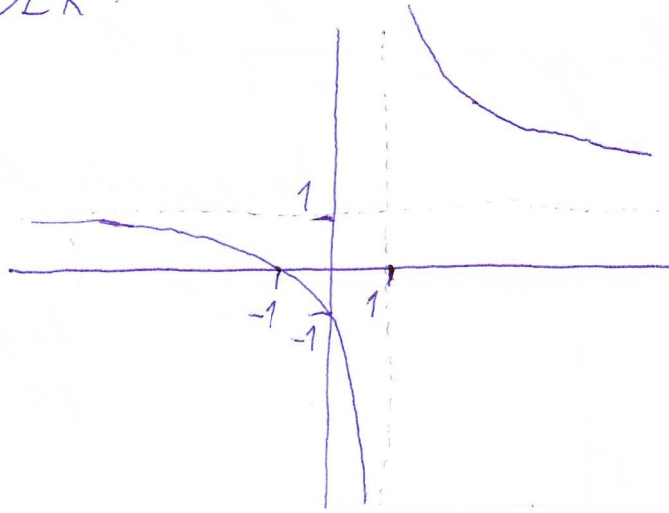
$$y = -2 + 1$$

$$y = -1$$

$$P_y [0, -1]$$

VÝSLEDEK:

náhod:



$$P_x [-1, 0]$$

$$P_y [0, -1]$$

Prüfungsaussage: $y = -\frac{1}{x+1} - 2$

$P_x = ? \quad y = 0$

$$0 = -\frac{1}{x+1} - 2 \quad | \cdot (x+1)$$

$$(x+1) \cdot 0 = -1 - 2(x+1)$$

$$0 = -1 - 2x - 2$$

$$0 = -2x - 3 \quad | + 2x$$

$$2x = -3 \quad | : 2$$

$$x = -\frac{3}{2}$$

$P_y = ? \quad x = 0$

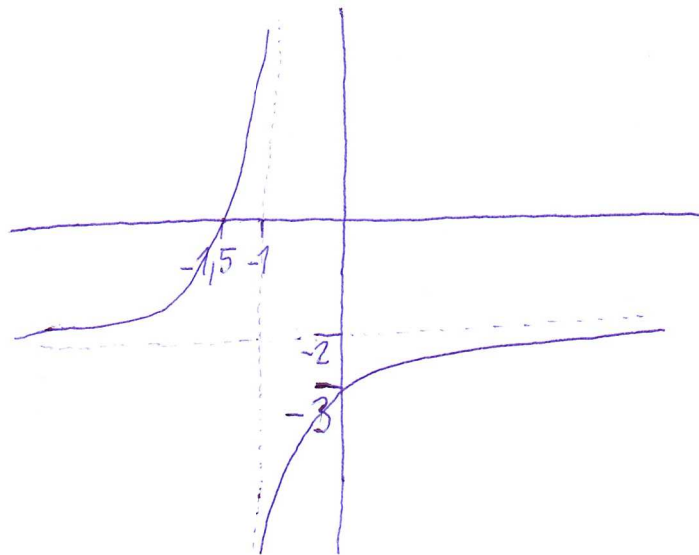
$$y = -\frac{1}{0+1} - 2$$

$$y = -3$$

$P_y [0, -3]$

$P_x [-\frac{3}{2}, 0]$

Skizze:



PŘEDPIS FUNKCE

$$y = \frac{x-1}{x-2}$$

Poděltejší dostas s koloco svaru $y = \frac{ex+f}{kx+l}$

e, f, k, l - jsou čísla
 x - padane máme

na svar $a \frac{1}{x+c} + b$.

KDYŽ ČITATEL SEČTU, DOSTANU ZASE $x-1$

$$y = \frac{x-1}{x-2} = \frac{\overbrace{x-2+1}}{x-2} = \frac{x-2}{x-2} + \frac{1}{x-2} =$$

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

$$P_x = ? \quad y = 0$$

$$0 = \frac{1}{x-2} + 1$$

$$0 = \frac{1}{x-2} + \frac{1}{1}$$

$$0 = \frac{1+x-2}{x-2}$$

$$0 = \frac{x-1}{x-2} \quad | \cdot (x-2)$$

$$(x-2) \cdot 0 = x-1 \quad | -x$$

$$-x = -1 \quad | \cdot (-1)$$

$$x = 1$$

$$P_x [1, 0]$$

$$P_y = ? \quad x = 0$$

$$y = \frac{1}{0-2} + 1$$

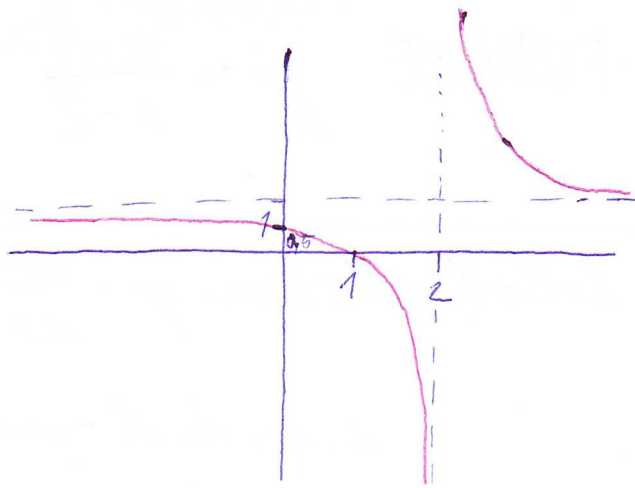
$$y = \frac{1}{-2} + \frac{1}{1}$$

$$y = \frac{1+(-2)}{-2}$$

$$y = \frac{-1}{-2}$$

$$y = \frac{1}{2}$$

$$P_y [0, \frac{1}{2}]$$



PŘEDPIS FUNKCE $f: y = \frac{2x-5}{3-x}$

$$\begin{aligned} \frac{2x-5}{3-x} &= \frac{2x-5}{-1(-3+x)} = \frac{2(x-\frac{5}{2})}{-1(x-3)} = \\ &= \frac{2}{-1} \frac{x-\frac{5}{2}}{x-3} = \\ &= \frac{2}{-1} \frac{x-3+\frac{1}{2}}{x-3} = \\ &= -2 \left(\frac{x-3}{x-3} + \frac{\frac{1}{2}}{x-3} \right) = \\ &= -2 \left(1 + \frac{\frac{1}{2}}{x-3} \right) = \\ &= -2 + \frac{-1}{x-3} = \\ &= \underline{\underline{-\frac{1}{x-3} - 2}} \end{aligned}$$

$$P_y = ? \quad x=0$$

$$y = -\frac{1}{0-3} - 2$$

$$y = \frac{-1}{-3} - 2$$

$$y = \frac{-1 - [2 \cdot (-3)]}{-3}$$

$$y = \frac{-1 - (-6)}{-3}$$

$$y = \frac{-1+6}{-3}$$

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

$$y = \frac{1}{-1} \cdot \frac{5}{3}$$

$$y = -1 \cdot \frac{5}{3}$$

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

$$P_y \left[0, -\frac{5}{3} \right]$$

$$P_x = ? \quad y=0$$

$$0 = -\frac{1}{x-3} - 2$$

$$0 = -\frac{1}{x-3} - 2 \quad | \cdot (x-3)$$

$$0 = -1 - 2(x-3)$$

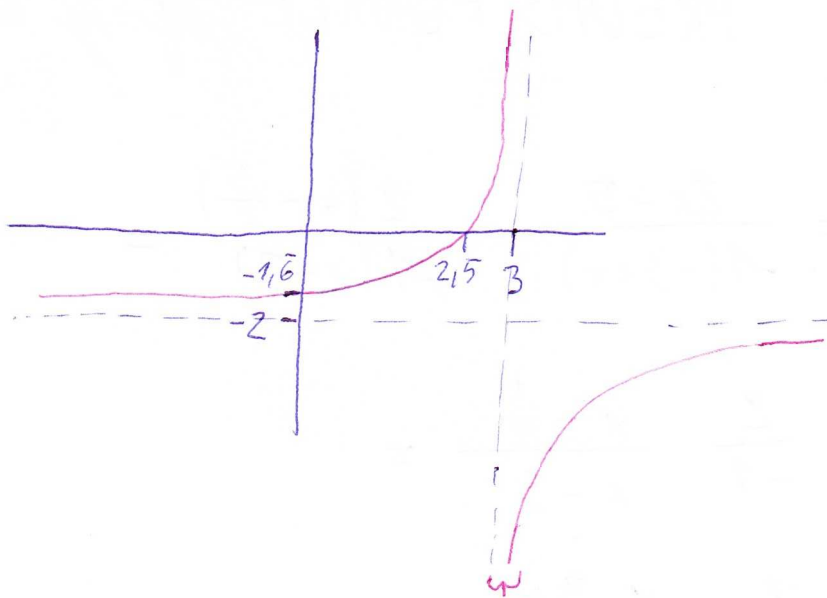
$$0 = -1 - 2x + 6$$

$$0 = -2x + 5 \quad | +2x$$

$$2x = 5 \quad | :2$$

$$x = \frac{5}{2}$$

$$P_x \left[\frac{5}{2}, 0 \right]$$



BLÍŽÍ SE, ALE NIKDY SE
NEDOTKNE OSY, PLATÍ PRO VŠECHNY
HYPERBOLY

PŘEDPIS FUNKCE $g: y = \frac{-2x - 8}{x + 3}$

Funkci, která se jmenuje g , převedu do tvaru, který potřebuji.

$$\begin{aligned} \frac{-2x - 8}{x + 3} &= \frac{-2(x + 4)}{x + 3} = \\ &= -2 \cdot \frac{x + 3 + 1}{x + 3} = \\ &= -2 \left(\frac{x + 3}{x + 3} + \frac{1}{x + 3} \right) = \\ &= -2 \left(1 + \frac{1}{x + 3} \right) = \\ &= -2 - \frac{2}{x + 3} = \\ &= -\frac{2}{x + 3} - 2 \end{aligned}$$

$$P_y = ? \quad x = 0$$

$$y = -\frac{2}{0 + 3} - 2$$

$$y = -\frac{2}{3} - \frac{2}{1}$$

$$y = \frac{-2 - 6}{3}$$

$$y = \frac{-8}{3}$$

$$P_y \left[0, -\frac{8}{3} \right]$$

$$P_x = ? \quad y = 0$$

$$0 = -\frac{2}{x + 3} - 2 \quad | \cdot (x + 3)$$

$$(x + 3) \cdot 0 = -2 - 2(x + 3)$$

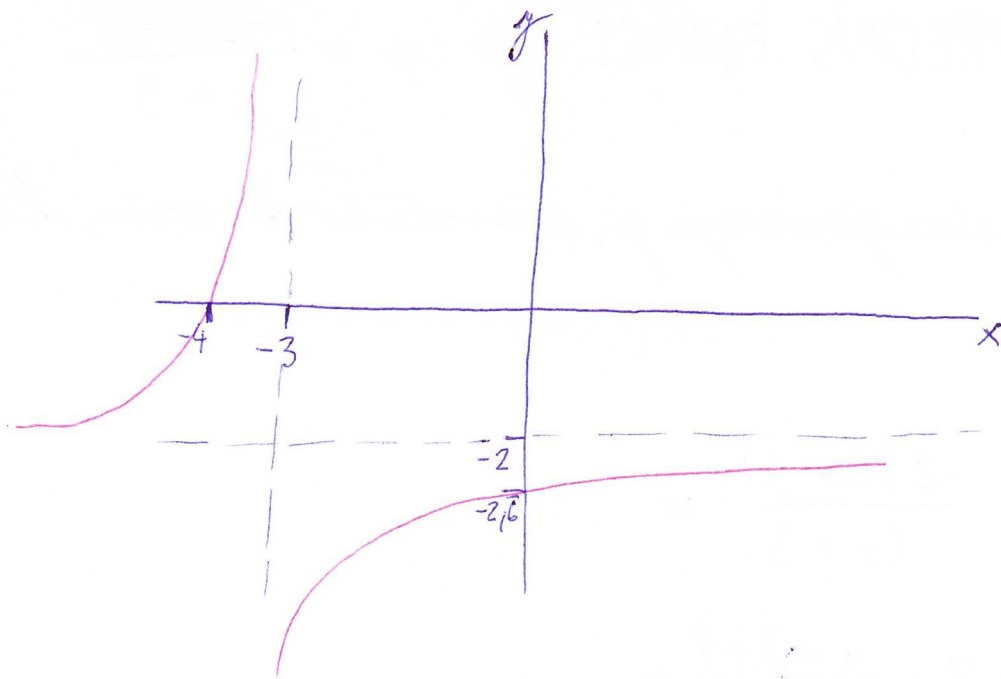
$$0 = -2 - 2x - 6$$

$$0 = -2x - 8 \quad | + 2x$$

$$2x = -8 \quad | : 2$$

$$x = -4$$

$$P_x \left[-4, 0 \right]$$



1 JINAK : $g : y = \frac{-2x - 8}{x + 3}$

$$\begin{aligned} (-2x - 8) : (x + 3) &= -2 + \frac{-2}{x + 3} = \\ \frac{-(-2x - 6)}{-2} &= -2 - \frac{2}{x + 3} = \end{aligned}$$

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

$$[-3, -2]$$

OPAKOVÁNÍ:

$$(2x-5):(3-x) = ?$$

SEŘADĚ POLYNOMY

$$\begin{array}{r} (2x-5) \cdot (-x+3) = -2 + \frac{1}{-x+3} \\ -(2x-6) \\ \hline 1 \end{array}$$

$$-2 + \frac{1}{-x+3} = -2 + \frac{1}{-1} \frac{1}{x-3} = -2 + (-1) \cdot \frac{1}{x-3} =$$

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

$$= \underline{\underline{-\frac{1}{x-3} - 2}}$$