

1. Riešte rovnice s neznámou x a parametrom p

a. $\frac{p^2(x-1)}{px-2} = 2$; $px-2=0$
 $x \neq \frac{2}{p}$

$$\downarrow$$

$$x(p-2) = (p+2)(p-2)$$

$$\left\{ \begin{array}{l} p=0 \dots x \in \emptyset \\ p=2 \dots x \in \mathbb{R} - \left\{ \frac{2}{2} \right\} \\ p \neq 0 \end{array} \right. \quad x = \frac{p+2}{p}$$

p	0	2	$\mathbb{R} - \{0, 2\}$
x	\emptyset	\emptyset	$\left\{ \frac{p+2}{p} \right\}$

b. $\frac{4}{x-p} + 2 = \frac{p}{p-x}$; $x-p \neq 0$
 $x \neq p$

$$\downarrow$$

$$2x = \frac{p-4}{p-4}$$

$$x = \frac{p-4}{p-4}$$

p	-4	$\mathbb{R} - \{-4\}$
x	\emptyset	$\left\{ \frac{p-4}{p-4} \right\}$

c. $\frac{p}{px+1} = \frac{6}{x+2}$; $x \neq -2$
 $x \neq -\frac{1}{p}$

$$\downarrow$$

$$5px = 2p - 6$$

$$\left\{ \begin{array}{l} p=0 \dots 0 \neq -6 \\ p \neq 0 \end{array} \right. \quad x = \frac{2p-6}{5p}$$

p	0	2	$\frac{1}{2}$	inad
x	\emptyset	\emptyset	\emptyset	$\left\{ \frac{2p-6}{5p} \right\}$

d. $\frac{p}{x} - \frac{4}{px} = 1 - \frac{2}{p}$

$$\downarrow$$

$$-2 = \frac{2p-6}{5p}$$

$$-10p = 2p-6$$

$$-12p = -6 \quad p = \frac{1}{2}$$

$$-1 = \frac{2p-6}{5p}$$

$$-5 = 2p-6$$

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

e. $\frac{p}{x} - \frac{4}{px} = 1 - \frac{2}{p}$; $p \neq 0$; $x \neq 0$

$$\downarrow$$

$$(p+2)(p-2) = x(p-2)$$

$$\left\{ \begin{array}{l} p=2 \dots 0=0 \quad x \in \mathbb{R} - \{0\} \\ p \neq 2 \end{array} \right. \quad \left\{ \begin{array}{l} 0=p+2 \\ -2=p \end{array} \right. \quad x = p+2$$

p	0	-2	2	inad
x	\emptyset	\emptyset	$\mathbb{R} - \{0\}$	$\{p+2\}$

2. Určte všetky reálne parametre a , pre ktoré má rovnica $\frac{2-a}{a} = \frac{2}{x-1}$ kladné riešenie.

$\frac{2-a}{a} = \frac{2}{x-1}$; $x \neq 1$; $a \neq 0$

$$\downarrow$$

$$x(2-a) = a+2 \quad | : (2-a)$$

$$\left\{ \begin{array}{l} a=2 \dots 0 \neq 4 \\ a \neq 2 \end{array} \right. \quad x = \frac{a+2}{2-a}$$

$$\frac{a+2}{2-a} > 0$$

a	-2	0	2
x	\emptyset	\emptyset	\emptyset

$a \in (-2, 0) \cup (0, 2)$

LINEÁRNE NEROVNICE S PARAMETROM

- osamelé x
- dvoj. \leq \geq

1. Riešte v \mathbb{R} nerovnice vzhľadom na parameter $p \in \mathbb{R}$

a. $p(x - p) \geq 3(p - x)$

$$\cancel{p}x - \cancel{p}^2 \geq 3p - 3x$$

$$x(p + 3) \geq p^2 + 3p$$

$$\begin{aligned} p+3=0 & \dots 0 \geq 9-9 \\ p=-3 & \dots 0 \geq 0 \quad | x \in \mathbb{R} \end{aligned}$$

$$\begin{aligned} p+3 > 0 & \dots x \geq \frac{p(p+3)}{p+3} \\ p > -3 & \dots x \geq p \end{aligned}$$

$$x \geq p$$

$$x \in \langle p, \infty \rangle$$

$$\begin{aligned} p+3 < 0 & \dots x \leq p \\ p < -3 & \dots x \leq p \end{aligned}$$

p	-3	$(-3, \infty)$	$(-\infty, -3)$
x	\mathbb{R}	$\langle p, \infty \rangle$	$(-\infty, p]$

$p \neq 0$

b. $x - 1 \geq \frac{x-5}{p}$

$p > 0$

$$p(x-1) \geq x-5$$

$p < 0$

$$p(x-1) \leq x-5$$

c. $p^2(x+1) > 2px + p$