

PR 3. $x^3 - 5x^2 + 6x = 0$

$$x^3 - 5x^2 + 6x = x(x^2 - 5x + 6) = x(x-2)(x-3)$$

$x^2 + bx + c = 0$ resp. pomocou diskriminantu

$$\begin{aligned} x_1 \cdot x_2 &= c = 6 \\ x_1 + x_2 &= -b = 5 \end{aligned} \Rightarrow \begin{aligned} x_1 &= 2 \\ x_2 &= 3 \end{aligned}$$

PR 4 $x^3 - 27 = 0$

$$x^3 - 3^3 = 0$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

$$x^3 - 3^3 = (x-3)(x^2 + 3x + 3^2)$$

PR 5 $x^3 + 1 = 0$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$x^3 + 1 = (x+1)(x^2 - x + 1)$$

PR 6 $x^3 - 3x^2 + 4x - 12 = 0$

$$x^2(x-3) + 4(x-3) = 0$$

$$(x^2 + 4)(x-3) = 0$$

PR 7 $x^3 + 3x^2 - 4 = 0$

korne sú deliteľmi -4, t.j. $\pm 1, \pm 2, \pm 4$

HORNEROVA SCHEMA

$$\begin{array}{r|rrrr} (x-1) \swarrow & 1 & 3 & 0 & -4 \\ 1 & 1 & 4 & 4 & 4 \\ \hline & 1 & 4 & 4 & 0 \end{array}$$

- 1 je koreň

$$\begin{array}{r|rrrr} & 1 & 4 & 4 & 0 \\ \hline & & & & \end{array} - 1 \text{ je koreň}$$

$x^2 + 4x + 4$

$$x^3 + 3x^2 - 4 = (x-1)(x^2 + 4x + 4) = (x-1)(x+2)^2$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

PR 8 $x^4 - 2x^3 - 5x^2 + 6x = 0$ $\uparrow$ chýba absolútny člen

$$x^4 - 2x^3 - 5x^2 + 6x = x(x^3 - 2x^2 - 5x + 6) \Rightarrow x=0 \text{ je koreň}$$

riešime komicu

$$x^3 - 2x^2 - 5x + 6 = 0$$

deliteľ 6 : $\pm 1, \pm 2, \pm 3, \pm 6$

$$\begin{array}{r|rrrr} 1 & 1 & -2 & -5 & 6 \\ & & 1 & -1 & -6 \\ \hline & 1 & -1 & -6 & 0 \end{array}$$

$$P(x) = (x-1)(x^2 - x - 6)$$

$$\begin{array}{r|rrrr} 1 & 1 & 1 & 0 & \\ \hline & 1 & 0 & -6 & \neq 0 \end{array} \quad x=1 \text{ nie je dvojnásobný koreň}$$

$$\begin{array}{r|rrrr} -2 & & -2 & 6 & \\ \hline & 1 & -3 & 0 & \end{array}$$

$$P(x) = (x-1)(x+2)(x-3)$$

PR 9. $4x^4 - 5x^2 + 1 = 0$

koreň $z = \frac{p}{q}$

p delí 1 $p = \pm 1$
 q delí 4 $q = \pm 1, \pm 2, \pm 4$

$$\Rightarrow z \in \left\{ \pm 1, \pm \frac{1}{2}, \pm \frac{1}{4} \right\}$$

a nasledujúce overovanie pomocou
 HORNEROVEJ SCHÉMY

INÝ POSTUP: $t = x^2$ substitúcia

$$4t^2 - 5t + 1 = 0 \quad (at^2 + bt + c = 0)$$

$$D = b^2 - 4ac = (-5)^2 - 4 \cdot 4 \cdot 1 = 9$$

$$\sqrt{D} = 3$$

$$t_{1/2} = \frac{-b \pm \sqrt{D}}{2a} = \frac{5 \pm 3}{2 \cdot 4} = \begin{matrix} 1 \\ \frac{1}{4} \end{matrix}$$

$$x^2 = t$$

$$x^2 = 1$$

$$x = \pm \sqrt{1}$$

$$x = \pm 1$$

$$x^2 = \frac{1}{4}$$

$$x = \pm \sqrt{\frac{1}{4}}$$

$$x = \pm \frac{1}{2}$$

$$P(x) = 4(x-1)(x+1)(x-\frac{1}{2})(x+\frac{1}{2}) = 0$$

$$PR10 \quad x^4 + 4x^3 + 7x^2 + 6x + 2 = 0$$

$$\omega \in \{\pm 1, \pm 2\}$$

$$\omega > 0 : P(\omega) > 0 \neq 0 \quad \text{nie je koreň}$$

$$\Rightarrow \omega < 0 \Rightarrow \omega \in \{-1, -2\}$$

	1	4	7	6	2
-1		-1	-3	-4	-2
	1	3	4	2	0
-1		-1	-2	-2	
	1	2	2	0	

$$P(x) = (x+1)^2(x^2+2x+2)$$

$$D = -4$$

ne nemá reálne korene