§1. Polynomy, kořeny polynomů

***68.** Objem 1 cm³ rtuti při teplotě t °C ($t \geqq 0$ °C) se dá určit podle vztahu

[redacted]

$V_t = 3 \,.\, 10^{-8} \,.\, t^2 + 2 \,.\, 10^{-4} \,.\, t + 1$. Jak vysoko musí vystoupit teplota, aby se objem rtuti zvětšil na 1,001 cm³?

$$3 \cdot 10^{-8} t^2 + 2 \cdot 10^{-4} t - 0.001 = 0$$

$$3t^2 + 2000t - 100000 = 0$$

$t = \frac{-1000 \pm 100\sqrt{130}}{3}$ Vyhoví pouze $t = \frac{-1000+100\sqrt{130}}{3} = 46.7°$

***353.** a) $4x + 3y - 2z = 40$, $6x - 5y + 3z = 50$, $3x + 2y + 5z = 220$;

b) $0{,}2x + 0{,}3y + 0{,}4z = 29$, $0{,}3x + 0{,}4y + 0{,}5z = 38$, $0{,}4x + 0{,}5y + 0{,}7z = 51$.

$$\bar{A} = \left(\begin{array}{ccc|c} 4 & 3 & -2 & 40 \\ 6 & -5 & 3 & 50 \\ 3 & 2 & 5 & 220 \end{array}\right) \sim \left(\begin{array}{ccc|c} 3 & 2 & 5 & 220 \\ 4 & 3 & -2 & 40 \\ 6 & -5 & 3 & 50 \end{array}\right) \sim \left(\begin{array}{ccc|c} 3 & 2 & 5 & 220 \\ 0 & 1 & -26 & -760 \\ 0 & -9 & -7 & -390 \end{array}\right) \sim$$
$$\left(\begin{array}{ccc|c} 3 & 2 & 5 & 220 \\ 0 & 1 & -26 & -760 \\ 0 & 9 & 7 & 390 \end{array}\right) \sim \left(\begin{array}{ccc|c} 3 & 2 & 5 & 220 \\ 0 & 1 & -26 & -760 \\ 0 & 0 & 241 & 7230 \end{array}\right) \sim \left(\begin{array}{ccc|c} 3 & 2 & 5 & 220 \\ 0 & 1 & -26 & -760 \\ 0 & 0 & 1 & 30 \end{array}\right) \sim$$
$$\left(\begin{array}{ccc|c} 3 & 0 & 57 & 1740 \\ 0 & 1 & -26 & -760 \\ 0 & 0 & 1 & 30 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 19 & 580 \\ 0 & 1 & -26 & -760 \\ 0 & 0 & 1 & 30 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 0 & 10 \\ 0 & 1 & 0 & 20 \\ 0 & 0 & 1 & 30 \end{array}\right)$$

$$\mathrm{P} = \{[10; 20; 30]\}$$

$$\bar{A} = \left(\begin{array}{ccc|c} 2 & 3 & 4 & 290 \\ 3 & 4 & 5 & 380 \\ 4 & 5 & 7 & 510 \end{array}\right) \sim \left(\begin{array}{ccc|c} 2 & 3 & 4 & 290 \\ 0 & -1 & -2 & -110 \\ 0 & -1 & -1 & -70 \end{array}\right) \sim \left(\begin{array}{ccc|c} 2 & 3 & 4 & 290 \\ 0 & 1 & 2 & 110 \\ 0 & 1 & 1 & 70 \end{array}\right) \sim \left(\begin{array}{ccc|c} 2 & 3 & 4 & 290 \\ 0 & 1 & 2 & 110 \\ 0 & 0 & -1 & -40 \end{array}\right) \sim$$
$$\left(\begin{array}{ccc|c} 2 & 3 & 4 & 290 \\ 0 & 1 & 2 & 110 \\ 0 & 0 & 1 & 40 \end{array}\right) \sim \left(\begin{array}{ccc|c} 2 & 0 & -2 & -40 \\ 0 & 1 & 2 & 110 \\ 0 & 0 & 1 & 40 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & -1 & -20 \\ 0 & 1 & 2 & 110 \\ 0 & 0 & 1 & 40 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 0 & 20 \\ 0 & 1 & 0 & 30 \\ 0 & 0 & 1 & 40 \end{array}\right)$$

$$\mathrm{P} = \{[20; 30; 40]\}$$

***371.** Jsou-li x, y, z neznámé a parametr p libovolné číslo, řešte soustavu a proveďte diskusi jejího řešení.

a) $x + y + z = 6$,
$x + py = 9$,
$y = z - 1$;

b) $x + y + z = 3$,
$x + p(y + z) = 5$,
$y - z = 0$;