

Algebra 1
Domáci úkol 5

49. $x^2 + 10x - 11$

a) doplním na úplný čtverec

$$\begin{aligned}x^2 + 10x - 11 &= (x+5)^2 - 25 - 11 = (x+5)^2 - 36 = (x+5)^2 - 6^2 = \\ &= [(x+5) - 6] \cdot [(x+5) + 6] = \underline{\underline{(x-1) \cdot (x+11)}}\end{aligned}$$

b) Viëtkovy vzorce

$$k_1 + k_2 = -\frac{b}{a}$$

$$k_1 \cdot k_2 = \frac{c}{a}$$

$$k_1 + k_2 = -10 \Rightarrow k_1 = -10 - k_2$$

$$k_1 \cdot k_2 = -11$$

$$(-10 - k_2) \cdot k_2 = -11$$

$$(10 + k_2) \cdot k_2 = 11 \Rightarrow k_2 = 1$$

$$k_1 = -11$$

$$\Rightarrow x^2 + 10x - 11 = \underline{\underline{(x-1)(x+11)}}$$

50. $x^2 + mx + 5 = 0$, $k_1 = k_2 + 4$

$$k_1 + k_2 = -m$$

$$k_1 \cdot k_2 = 5$$

$$(k_2 + 4) \cdot k_2 = 5 \Rightarrow k_2 = \underline{\underline{1}} \quad (1+4) \cdot 1 = 5 \quad k_1 = \underline{\underline{5}}$$

$$5 + 1 = -m \Rightarrow m = \underline{\underline{-6}}$$

zk.: $x^2 - 6x + 5 = 0$

$$x_{1,2} = \frac{6 \pm \sqrt{36 - 20}}{2} = \frac{6 \pm \sqrt{16}}{2} = \frac{6 \pm 4}{2}$$

$$x_1 = 5, x_2 = 1 \checkmark$$

$$51. \quad 5x^2 + 8x + 5 = 0$$

kořeny: k_1, k_2

kořeny druhé rovnice: $3k_1, 3k_2$

$$k_1 + k_2 = -\frac{8}{5} \Rightarrow 3k_1 + 3k_2 = -\frac{24}{5}$$

$$k_1 \cdot k_2 = 1 \Rightarrow 3k_1 \cdot 3k_2 = 9 = \frac{45}{5}$$

$$ax^2 + bx + c = 0$$

$$\underline{\underline{5x^2 + 24x + 45 = 0}}$$

$$\text{zk.: } x_{1,2} = \frac{-24 \pm \sqrt{24^2 - 4 \cdot 5 \cdot 45}}{10} = \frac{-24 \pm \sqrt{-324}}{10} = \frac{-24 \pm i \cdot 18}{10}$$

převodní rovnice:

$$x_{1,2} = \frac{-8 \pm \sqrt{8^2 - 4 \cdot 5 \cdot 5}}{10} = \frac{-8 \pm \sqrt{-36}}{10} = \frac{-8 \pm i \cdot 6}{10}$$

po 3x menší

