

Kružnice - sbírka I.

47/5.3 Najděte S a r kružnice

$$a) x^2 + y^2 - 6x + 4y - 23 = 0$$

$$(x-3)^2 - 9 + (y+2)^2 - 4 - 23 = 0$$

$$\underline{(x-3)^2 + (y+2)^2 = 36}$$

$$\underline{S[3; -2] \quad r = \sqrt{36} = 6}$$

48/5.5 napište mi kružnici s průměrem AB

$$d) A[2; -2] \quad B[-2; -5]$$

$$S_{AB} \dots \text{střed kružnice} \quad S_{AB} \left[0; -\frac{7}{2} \right]$$

$$r = |AS| = \sqrt{4 + \frac{9}{4}} = \sqrt{\frac{25}{4}} = \frac{5}{2}$$

$$k: \underline{x^2 + \left(y + \frac{7}{2}\right)^2 = \frac{25}{4}} \quad \text{? OR? } x^2 + y^2 + 7y + \frac{49}{4} - \frac{25}{4} = 0$$

$$\underline{x^2 + y^2 + 7y + 6 = 0}$$

48/5.6 určete pro jaké ρ je to ne kružnice
 $S, r = ?$

$$d) x^2 + y^2 - 3x + 5y + \rho = 0$$

$$\left(x - \frac{3}{2}\right)^2 - \frac{9}{4} + \left(y + \frac{5}{2}\right)^2 - \frac{25}{4} + \rho = 0$$

$$\left(x - \frac{3}{2}\right)^2 + \left(y + \frac{5}{2}\right)^2 = \frac{34}{4} - \rho$$

$$S \left[\frac{3}{2}; -\frac{5}{2} \right]$$

$$\frac{34}{4} - \rho > 0$$

$$r = \sqrt{\frac{34}{4} - \rho}$$

$$\rho < \frac{34}{4} = \frac{17}{2} \quad \underline{\rho \in (-\infty; \frac{17}{2})}$$

48/5.11 Sestrojte množinu spoj. bodů os x a y s k :

$$a) k: x^2 + y^2 - 4x + 5y = 0$$

průsečíky s osou x : osa x : $y = 0$

$$x^2 - 4x = 0$$

$$x(x-4) = 0$$

$$x_1 = 0 \quad P_1[0; 0]$$

$$x_2 = 4 \quad P_2[4; 0]$$

osa y : $x = 0$

$$y^2 + 5y = 0$$

$$y(y+5) = 0$$

$$y_1 = 0 \quad P_3[0; 0]$$

$$y_2 = -5 \quad P_4[0; -5]$$

48/5.13 Vzdaje' p'ovaha μ a k

$$a) \mu: 2x - y - 6 = 0 \quad k: x^2 + y^2 - 4x - 5y - 1 = 0$$

$$\mu: y = 2x - 6 \rightarrow k: x^2 + (2x - 6)^2 - 4x - 5(2x - 6) - 1 = 0$$

$$x^2 + 4x^2 - 24x + 36 - 4x - 10x + 30 - 1 = 0 \quad \mu \text{ je sp\text{c}ma } k.$$

$$5x^2 - 38x + 65 = 0$$

$$x_{1/2} = \frac{38 \pm \sqrt{38^2 - 4 \cdot 5 \cdot 65}}{10} \left\{ \begin{array}{l} x_1 = 5 \quad y_1 = 4 \quad R_1 [5; 4] \\ x_2 = \frac{13}{5} \quad y_2 = -\frac{4}{5} \quad R_2 [\frac{13}{5}; -\frac{4}{5}] \end{array} \right.$$

49/5.16 urcite $a \in \mathbb{R}$ pro kter\`a' ma' kru\`znice

$$x^2 + y^2 = 4 \text{ a p\`r\`mka } ax - 4y - 16 = 0$$

pl\`n\`e 1 spol. bod.

$$y = \frac{ax - 16}{4} = \frac{ax}{4} - 4$$

$$x^2 + \left(\frac{ax}{4} - 4\right)^2 = 4$$

$$x^2 + \frac{a^2 x^2}{16} - 2ax + 16 = 4 \quad | \cdot 16$$

$$16x^2 + a^2 x^2 - 32ax + 192 = 0$$

kr. se s parametrem

$$(16 + a^2)x^2 - 32ax + 192 = 0$$

$$A = 16 + a^2 \quad D = 0$$

$$B = -32a \quad B^2 - 4AC = 0$$

$$C = 192 \quad 1024a^2 - 4 \cdot 192(16 + a^2)$$

$$1024a^2 - 12288 - 768a^2 = 0$$

$$256a^2 = 12288$$

$$a^2 = 48$$

$$a = \pm \sqrt{48} = \pm 4\sqrt{3}$$