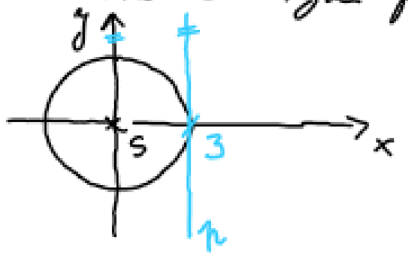
Kružnice a přímka – sbírka II

49/5.18 napište rci kružnice se středem v počátku s.s., která se dotýká přímky $x-3=0$



$S[0,0]$ $\quad x-3=0 \Rightarrow x=3$

$r=3$

$k: \underline{\underline{x^2+y^2=9}}$

50/5.26 určete vzáj. polohu kružnice

$x^2+y^2-4x+10y+24{,}5=0$ a přímky $x-y+c=0$ v závislosti na $\underline{c}$.

$p: x=y-c$

$(y-c)^2+y^2-4(y-c)+10y+24{,}5=0$

$y^2-2cy+c^2+y^2-4y+4c+10y+24{,}5=0$

$2y^2+(6-2c)y+c^2+4c+24{,}5=0$

$A=2$

$B=6-2c$

$C=c^2+4c+24{,}5$

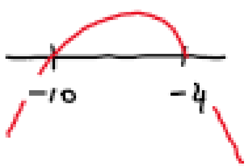
$D=B^2-4AC$

$D=(6-2c)^2-8(c^2+4c+24{,}5)=$

$=36-24c+4c^2-8c^2-32c-196$

$=-4c^2-56c-160$

$D>0$



$c\in(-10;-4)$

sečna

$D=0$

$-4c^2-56c-160=0$

$c^2+14c+40=0$

$c_{1,2} \begin{cases} -4 \\ -10 \end{cases}$

$c=\{-10;-4\}$

tečna

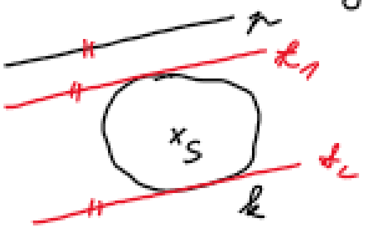
$D<0$

$c\in(-\infty;-10)\cup(-4;+\infty)$

vnější přímka

50/5.33 Napište rce tečen kružnice k, které jsou ∥ s přímkou p

a) $k: (x-2)^2+(y+6)^2=13$; $p: 2x-3y+5=0$



$t_1, t_2: 2x-3y+c=0$

! $D=0$!

$x=\dfrac{3y-c}{2} \longrightarrow k$

$$\left(\frac{3y-c}{2}-2\right)^2+(y+6)^2-13=0$$

$$\frac{9y^2-6cy+c^2}{4}-6y+2c+4+y^2+12y+36-13=0$$

$$-\,||\,-\quad +y^2+6y+2c+27=0 \quad /\cdot 4$$

$$9y^2-6cy+c^2+4y^2+24y+8c+108=0$$

$$13y^2+(24-6c)y+c^2+8c+108=0$$

$A=13$
$B=24-6c$
$C=c^2+8c+108$

$D=0$

$$\underbrace{(24-6c)^2}_{[6(4-c)]^2}-52(c^2+8c+108)=0$$

$$36(16-8c+c^2)-52c^2-416c-5616=0$$

$$576-288c+36c^2-52c^2-416c-5616=0$$

$$-16c^2-704c-5040=0 \quad /:(-16)$$

$$c^2+44c+315=0$$

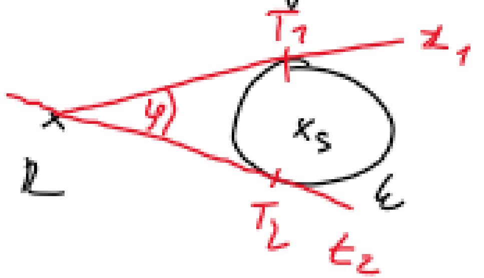
$$c_{1/2}=\frac{-44\pm\sqrt{44^2-4\cdot 315}}{2} \left\langle \begin{matrix}-9\\ -35\end{matrix}\right.$$

$t_1: 2x-3y-9=0$

$t_2: 2x-3y-35=0$

51/5.36 Velikost úhlu, pod kterým je vidět kružnice z bodu $R[-7;-2]$

a) $k: x^2+y^2+3x+4y-6=0$



$\varphi = ?$ $\varphi = |\sphericalangle t_1, t_2|$

nebo $\frac{\varphi}{2} = |\sphericalangle t_1, \overleftrightarrow{RS}|$

polára? $\left(x+\frac{3}{2}\right)^2 - \frac{9}{4} + (y+2)^2 - 4 - 6 = 0$

$$\left(x+\frac{3}{2}\right)^2 + (y+2)^2 = \frac{49}{4} \qquad S\left[-\frac{3}{2}; -2\right]$$

polára: $p: \left(-7+\frac{3}{2}\right)\left(x+\frac{3}{2}\right) + (-2+2)(y+2) - \frac{49}{4} = 0$

$p \cap k \rightarrow T_1, T_2 \rightarrow t_1, t_2 \rightarrow \varphi$