09.03. 2022 Шеста седмица. С, Ч

Зад 1

1) $(x-2)^2 + y^2 = 4$ $\boxed{C(2,0)\ r=2}$

2) $(x-1)^2 + (y-1)^2 = 1$ $\boxed{C(1,1)\ r=1}$

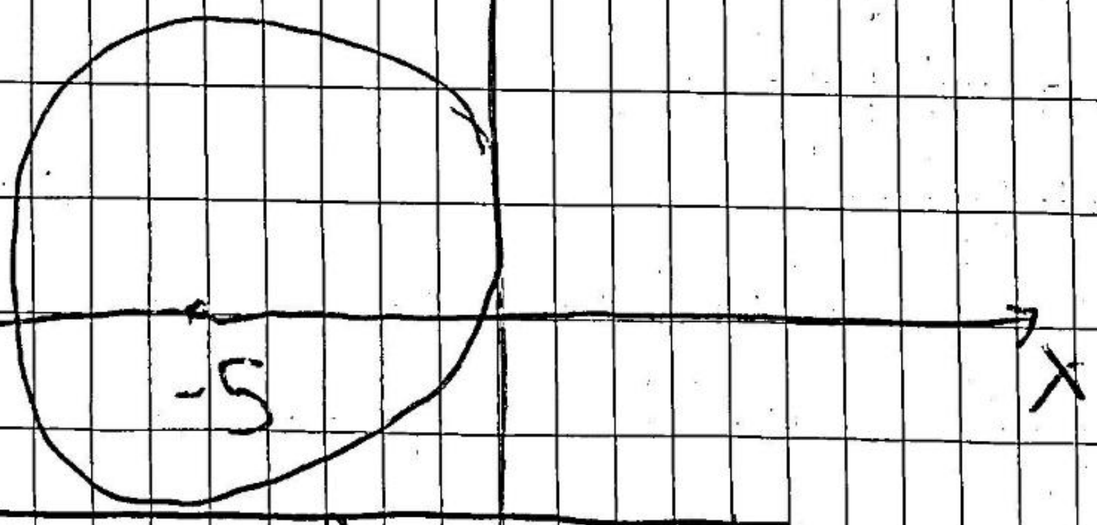
3) $x^2+6x-y^2=0$ допълване до пълен квадрат

$x^2 - 6x + 9 - 9 + y2 = 0$

$(x+3)^2 + y^2 = 9$

$\boxed{C(-3,0)\ r=3}$

Зад 2 (-5,0)
допира се до Oy



$\boxed{k(x+5)^2 + y^2 = 25}$

Зад 3.
$M(-4,3)$
центр. окр.
$C(0,0)$

$x^2 + y^2 = r^2$
$(-4)^2 + 3^2 = r^2$
$r = 5$

Ur: $x^2 + y^2 = 25$

Зад 4
$A(2,1)$ $B(0,3)$ $C(2,2)$
$k(C, r)$ → радиуса
а) $k(C, 1)$ каноничено у-е
б) взаимно пол. т.А и т.В спрямо k

а) $(x-2)^2 + (y-2)^2 = 1$

б) $A(2,1)$ $(2-2)^2 + (1-2)^2 = 1$
т. лежи на окр. **$A \in k$**

$B(0,3)$
$(0-2)^2 + (3-2)^2 = 4 + 1 = 5$ $5 > 2.5$ т.е. $5 > 1$

В - външна за К

Зад 1

$k(A,5)$ $A(1,-3)$

Без пароли на k и g: $2x-y+5=0$

$k: (x-1)^2+(y+3)^2=25$

$d(A,g)=\left|\frac{2\cdot1+3+5}{\sqrt{5}}\right|=\frac{2\sqrt{5}}{5}$ (25)

$2\sqrt{5} < 5(r) \Rightarrow$ **g пресича k**

Зад 2. Да се намерят общите точки на правата $g: 2x-y+5=0$ и $k: (x-1)^2+(y+3)^2=25$

а)

$$\begin{cases} 2x-y+5=0 \\ (x-1)^2+(y+3)^2=25 \end{cases}$$

$2x=y-5$

$x=\frac{y-5}{2}$

$$\left(\frac{y-5}{2}-1\right)^2+(y+3)^2=25$$

$-y=-5-2x$

$y=5+2x$

$$\left(\frac{y-7}{2}\right)^2+(y+3)^2=25$$

$$\frac{y^2-14y+49}{4}+y^2+6y+9-25=0$$

$$y^2-14y+49+4y^2+24y+36-25=0$$

$$5y^2+10y+58=0$$

$(x-1)^2+(5+2x+3)^2=25$

$x^2-2x+2+(8+2x)^2=25$

$x^2-2x+2+4x^2+32x+64-25=0$

$5x^2+30x+40=0$

$x(x-2)+7(x+2)=0$

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

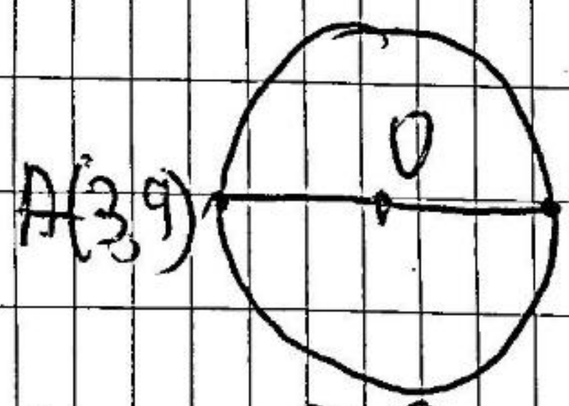
$x=-2$	$x=-4$
$y=1$	$y=-3$

б) $C(-2,1)$ $D(-4,-3)$ $\overrightarrow{CD}\ (-2,-4)$

$|\overrightarrow{CD}|=\sqrt{4+16}=\sqrt{20}=2\sqrt{5}$

дължината на хордата

Задз Да се състави ур-е на ок ако краищата на един негов диаметър са точките $A(3,9)$ $B(7,3)$



$O\left(\frac{7+3}{2},\frac{9+3}{2}\right)=O(5,6)$

$\overrightarrow{AB}\ (4,-6)$ $|\overrightarrow{AB}|=\sqrt{16+36}=\sqrt{52}=2\sqrt{13}$

$r=\frac{2\sqrt{13}}{2}$

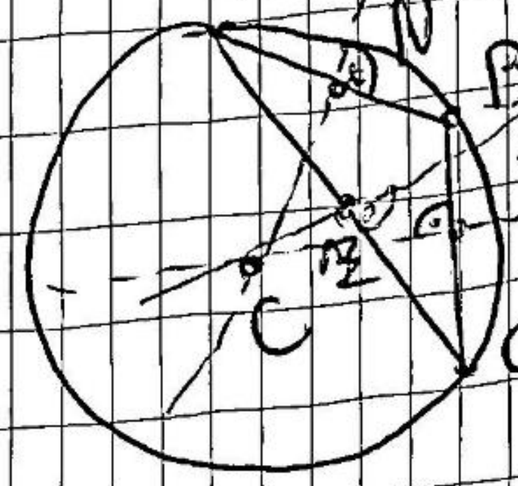
$(x-5)^2+(y-6)^2=\sqrt{80}$

ур. $(x-5)^2+(y-6)^2=\sqrt{80}^2$

80 лв

Зад 4 $A(2,1)$ $B(0,3)$ $C(2,2)$

Съставете ур. на окр. описана около $\triangle ABC$



$N(1,2)$ $M\left(\frac{1}{2},\frac{5}{2}\right)$

$\overrightarrow{AB}(-2,2)$ $\overrightarrow{BC}(2,-1)$

S_{AB}: $-2(x-1)+2(y-2)=0$

$-2x+2+2y-4=0$

$-x+1+y-2=0$

$-x+y-1=0$

$\boxed{x-y+1=0}$

$x=y-1$ $x=-\frac{5}{2}-1=-\frac{7}{2}$

S_{BC}: $2\left(x-1\right)-\left(y-\frac{5}{2}\right)=0$

$2x-2-y+\frac{5}{2}=0$

$4x-4-2y+5=0$

$\underline{S_{BC}\ 4x-2y+1=0}$

$4x-2(y-1)+1=0$

$4x=2$

$4(y-1)-2(y-2)+1=0$

$4y-4-2y+4+1=0$

$2y-3=0$

$\boxed{y=\frac{3}{2}}$

$\boxed{y=-\frac{1}{2}}$

$4(y-1)-2y+1=0$

$4y-4-2y+1=0$

$2y-3=0$

$y=\frac{3}{2}$

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

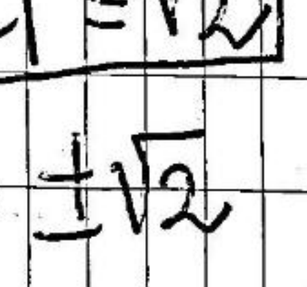
Кръг $C\left(\frac{1}{2}; \frac{3}{2}\right)$

$\overrightarrow{AC}\left(\frac{1}{2}-2; \frac{3}{2}-1\right) = \overrightarrow{AC}\left(-\frac{3}{2}; \frac{1}{2}\right)$ $|\overrightarrow{AC}| = \frac{\sqrt{10}}{2}$

$k: \left(x-\frac{1}{2}\right)^2 + \left(y-\frac{3}{2}\right)^2 = \frac{5}{2}$

Зад 5. $c = ?$ $g: x - y + c = 0$

g е допирателна $\Rightarrow$ $(x-2)^2 + (y-2)^2 = 1$



$C(2,2)$

$d = \frac{|2-2+c|}{\sqrt{2}}$ $\frac{|c|}{\sqrt{2}} = 1$

$|c| = \sqrt{2}$

$c = \pm\sqrt{2}$

$g_1: x + y + \sqrt{2} = 0 \Rightarrow y = x + \sqrt{2}$

$g_2: x - y - \sqrt{2} = 0 \Rightarrow y = x - \sqrt{2}$

$y = kx + n$ $k = 1 = \operatorname{tg}\varphi$

$\varphi = 45^\circ$

$\frac{\pi}{4}$

Задача Да се състави у-е на окр минаваща през $A(5,0)$ и $B(1,4)$ с център в/у правата $\ell: 2x+y-3=0$

$w: (x-a)^2+(y-b)^2=r^2$

a, b, r

$(5-a)^2+(0-b)^2=r^2$ $\quad A \in w$

$(1-a)^2+(4-b)^2=r^2$ $\quad B \in w$

$a+b-3=0$ $\quad y(a,b) \in \ell$

10.03

2022

$25+10a+a^2+b^2=r^2$

$1-2a+a^2+16-8b+b^2=r^2$

$a+b-3=0 \quad a=3-b$

$25-30+10b+(3-b)^2+b^2=r^2$

$2b^2+4b+4=r^2$

$1-2(3-b)+(3+b)^2+16-8b+b^2=r^2$

$2b^2-12b+20$

$2b^2-12b+20=2b^2+4b+4$ $\quad b=1$ $\quad a=2$