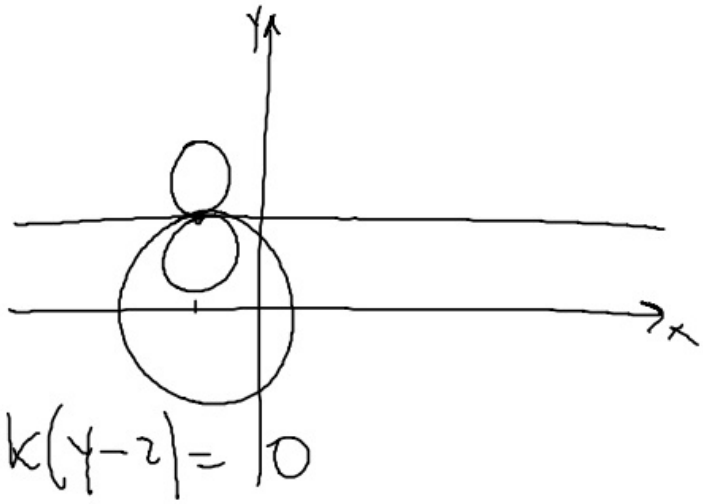
$y-2=0$

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



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

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

$R=4 \quad \sqrt{\alpha^2+\beta^2-c}=4$

$\sqrt{1+\left(\frac{4-k}{2}\right)^2-5+2k}=4$

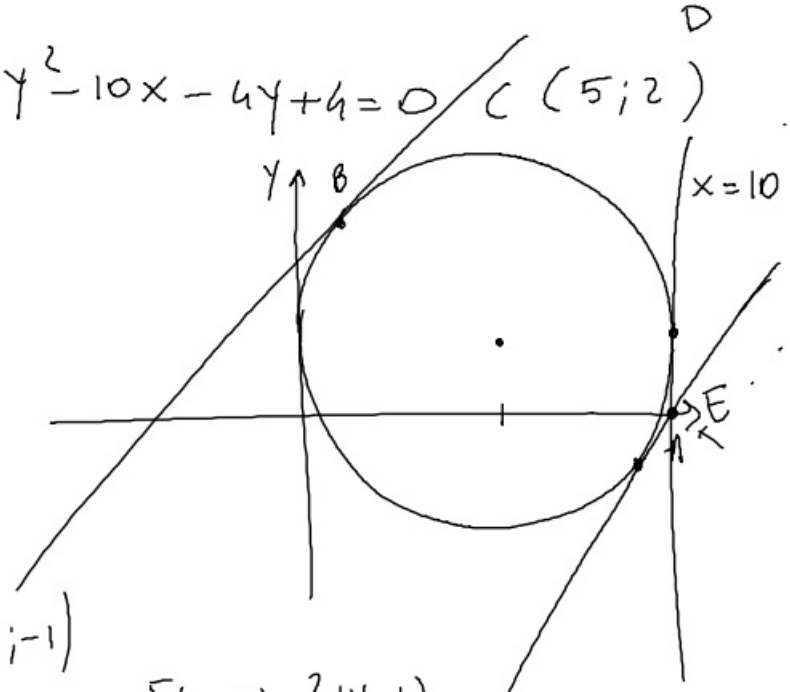
$\sqrt{1+\frac{k^2+16-8k}{4}-5+2k}=4$

$\sqrt{\frac{\cancel{4}+k^2+\cancel{16}-\cancel{8k}-\cancel{20}+\cancel{8k}}{4}}=4$

$\sqrt{\frac{k^2}{4}}=4 \qquad \frac{k^2}{4}=16 \qquad k^2=64$

$k=\pm 8$

$x^2+y^2-10x-4y+4=0$ $C(5;2)$



tg A $(9;-1)$

$$x\cdot 9+y(-1)-\cancel{10}^{5}\left(\frac{x+9}{\cancel{2}}\right)-\cancel{4}^{2}\left(\frac{y-1}{\cancel{2}}\right)+4=0$$

$$9x-y-5x-45-2y+2+4=0$$

$$4x-3y-39=0$$

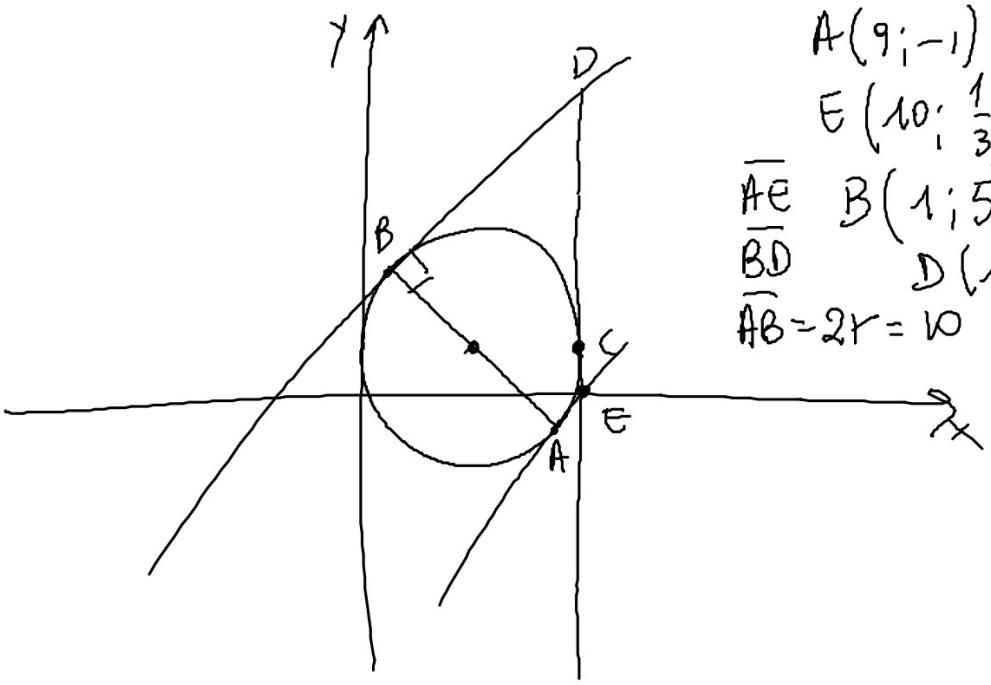
$$x+5y-10\left(\frac{x+1}{2}\right)-4\left(\frac{y+5}{2}\right)+4=0$$

$$x+5y-5x-5-2y-10+4=0$$

$$-4x+3y-11=0$$

$$E=\begin{cases}x=10\\ y=\frac{1}{3}\end{cases} \qquad E\left(10;\frac{1}{3}\right)$$

$$D=\begin{cases}x=2\\ y=17\end{cases} \qquad D(10;17)$$



$A(9;-1)$

$E\left(10;\frac{1}{3}\right)$

$\overline{AE}$ $B(1;5)$

$\overline{BD}$ $D(10;A)$

$\overline{AB}=2r=10$

$4x+3y-23=0$ $\qquad$ $8+3y-23=0$

$x=2$ $\qquad$ $3y=15$ $\quad y=5$

$T(2;5)$ $\quad (x-2)^2+(y-5)^2=0$

$$x^2+y^2-4x-10y+29=0$$

$$x^2+y^2-4x-10y+29+k(4x+3y-23)=0$$

$$x^2+y^2+(4k-4)x+(3k-10)y+29-23k=0$$

$\alpha = 2-2k$

$\beta = \dfrac{10-3k}{2}$ $\qquad (2-2k)^2+\left(\dfrac{10-3k}{2}\right)^2-29+23k=25$

$$4+4k^2-8k+\frac{100+9k^2-60k}{4}-29+23k=25$$

$$16+16k^2-\cancel{32k}+100+9k^2-\cancel{60k}-216+\cancel{92k}=0$$

$25k^2-100=0$ $\quad k^2=4$ $\quad k=\pm 2 \Rightarrow k=2$

$$x^2+y^2+4x-4y-17=0$$

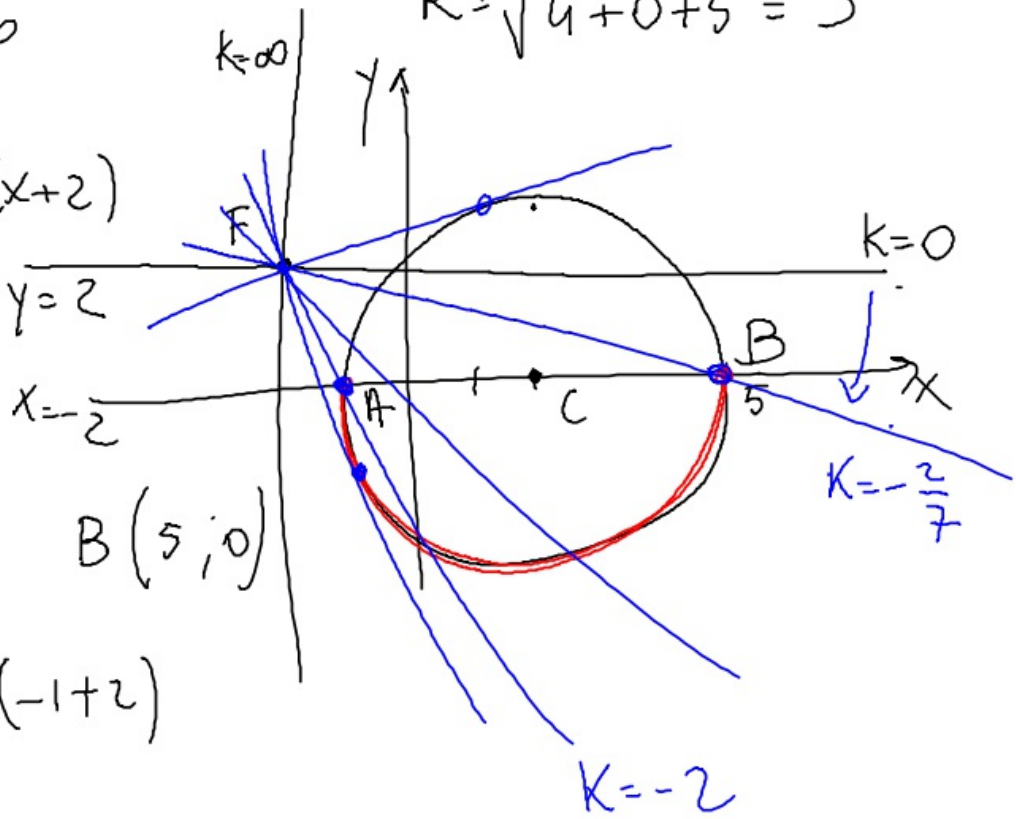
$$x^2+y^2-20x-22y+121=0 \qquad C(2;5)$$

$$\begin{cases} x' = 2a - x \\ y' = 2b - y \end{cases} \qquad \begin{cases} x = 4 - x' \\ y = 10 - y' \end{cases}$$

$$\begin{cases} x^2+y^2-4x-5=0 \\ y=kx+2k+2 \\ y<0 \end{cases}$$

$C(2;0)$

$R=\sqrt{4+0+5}=3$



$y-2=k(x+2)$

$$\begin{cases} y-2=0 \\ x+2=0 \end{cases}$$

$A(-1;0)$ $B(5;0)$

(A) $-2=k(-1+2)$

$-2=k$

(B) $-2=k(5+2)$

$7k=-2$; $k=-\frac{2}{7}$

$y-2=k(x+2)$

$kx+2k-y+2=0$

$kx-y+2k+2=0$ $C(2;0)$ $R=3$