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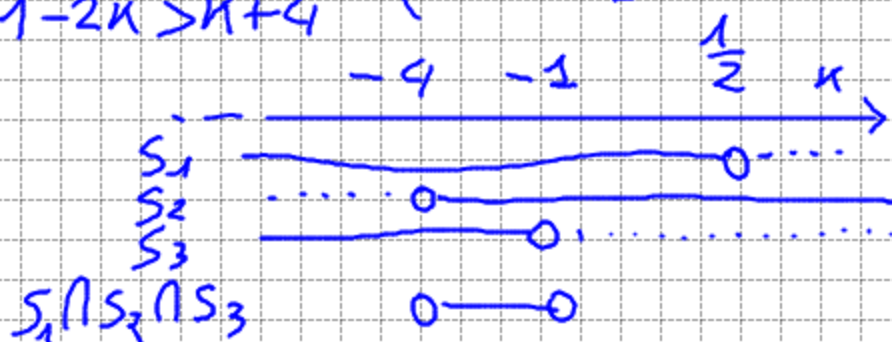
$$\frac{x^2}{1-2k} + \frac{y^2}{k+4} = 1$$

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

$$a > b$$

$$\begin{cases} 1-2k > 0 \\ k+4 > 0 \\ \sqrt{1-2k} > \sqrt{k+4} \end{cases}$$

$$\begin{cases} k < \frac{1}{2} \\ k > -4 \\ 1-2k > k+4 \end{cases} \quad \begin{cases} k < \frac{1}{2} \\ k > -4 \\ k < -1 \end{cases}$$



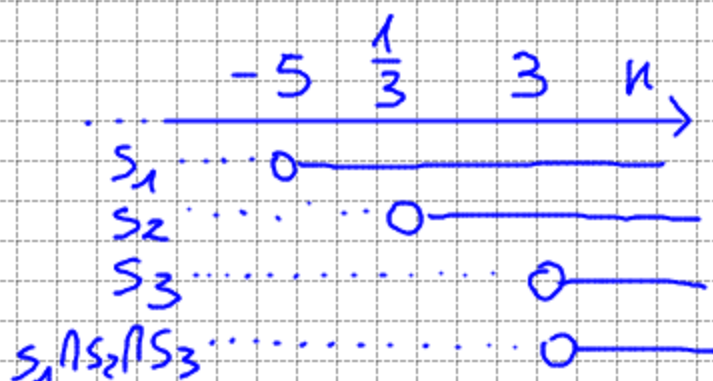
$$\text{Sol.: } \{k \in \mathbb{R} \mid -4 < k < -1\}$$

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$$\frac{(3k-1)x^2}{(3k-1)(k+5)} + \frac{(k+5)y^2}{(3k-1)(k+5)} = \frac{3k^2 + 4k - 5}{(3k-1)(k+5)}$$

$$\frac{x^2}{k+5} + \frac{y^2}{3k-1} = 1$$

$$\begin{cases} k+5 > 0 \\ 3k-1 > 0 \\ 3k-1 > k+5 \end{cases}$$



$$\begin{cases} k > -5 \\ k > \frac{1}{3} \\ k > 3 \end{cases}$$

$$\text{Sol.: } \{k \in \mathbb{R} \mid k > 3\}$$

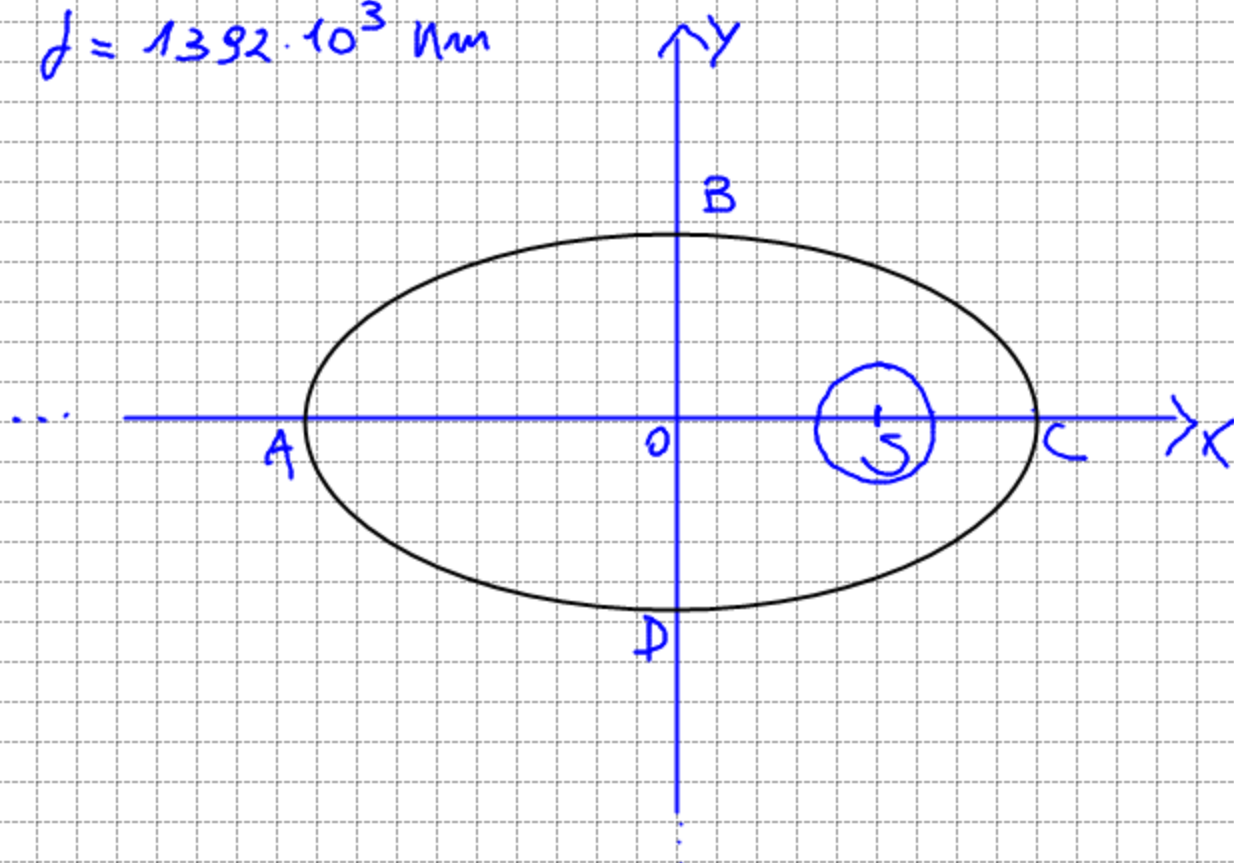
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$$e = 0,0167$$

$$\overline{CS} = \text{perielio} = 147,1 \cdot 10^6 \text{ Km}$$

$$\overline{AS} = \text{afelio} = 152,1 \cdot 10^6 \text{ Km}$$

$$d = 1392 \cdot 10^3 \text{ Km}$$



$$2a = 147,1 \cdot 10^6 \text{ Km} + 152,1 \cdot 10^6 \text{ Km} + 1392 \cdot 10^3 \text{ Km} =$$

$$2a = 147100 \cdot 10^3 \text{ Km} + 152100 \cdot 10^3 \text{ Km} + 1392 \cdot 10^3 \text{ Km}$$

$$2a = 300592 \cdot 10^3 \text{ Km}$$

$$a = 150296 \cdot 10^3 \text{ Km} = 1,50296 \cdot 10^8 \text{ Km}$$

$$e = \frac{c}{a}$$

$$c = e \cdot a = 0,0167 \cdot 1,50296 \cdot 10^8 \text{ Km}$$

$$c = 0,025 \cdot 10^8 \text{ Km} = 2,5088 \cdot 10^6 \text{ Km}$$

$$b^2 = a^2 - c^2$$

$$b = \sqrt{a^2 - c^2} = \sqrt{(1,50296 \cdot 10^8 \text{ Km})^2 - (2,5088 \cdot 10^6 \text{ Km})^2}$$

$$= \sqrt{2,2589 \cdot 10^{16} \text{ Km}^2 - 6,2936 \cdot 10^{12} \text{ Km}^2}$$

$$= \sqrt{22589 \cdot 10^{12} \text{ Km}^2 - 6,2936 \cdot 10^{12} \text{ Km}^2}$$

$$= \sqrt{22583 \cdot 10^{12} \text{ Km}^2}$$

$$= 150,28 \cdot 10^6 \text{ Km}$$

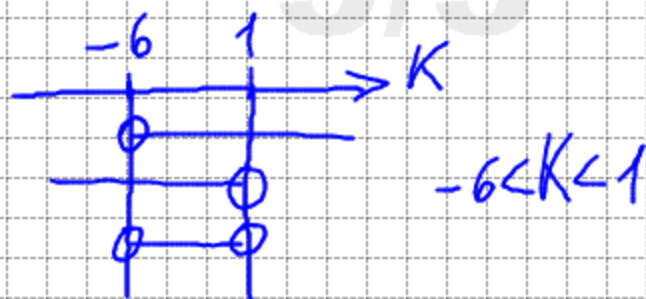
$$\frac{x^2}{2,2589 \cdot 10^{16}} + \frac{y^2}{2,2583 \cdot 10^{16}} = 1$$

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$$\frac{x^2}{k+6} + \frac{y^2}{1-k} = 1$$

$$r: y = -2x + 4$$

$$\begin{cases} k+6 > 0 \\ 1-k > 0 \end{cases} \begin{cases} k > -6 \\ k < 1 \end{cases}$$



$$\begin{cases} \frac{x^2}{k+6} + \frac{y^2}{1-k} = 1 \\ y = -2x + 4 \end{cases} \begin{cases} \frac{x^2}{k+6} + \frac{4x^2 + 16 - 16x}{1-k} = 1 \\ y = -2x + 4 \end{cases}$$

$$\begin{cases} \frac{x^2 - kx^2 + 4kx^2 + 16k - 16kx + 24x^2 + 96 - 96x}{(k+6)(1-k)} = 1 \\ y = -2x + 4 \end{cases}$$

$$\begin{cases} 25x^2 + 3kx^2 - 96x - 16kx + 16k + 96 = k + 6 - k^2 - 6k \\ y = -2x + 4 \end{cases}$$

$$\begin{cases} (25+3k)x^2 - (96+16k)x + k^2 + 21k + 90 = 0 \\ y = -2x + 4 \end{cases} \Rightarrow \Delta = 0$$

$$\Delta = 0 \rightarrow (48+8k)^2 - (25+3k)(k^2+21k+90) = 0$$
$$[8(6+k)]^2 - (25+3k)(k+6)(k+15) = 0$$

$$64(k+6)^2 - (25+3k)(k+6)(k+15) = 0$$

$$(k+6) [64k + 384 - 25k - 375 - 3k^2 - 45k] = 0$$

$$k = -6 \text{ NO} \quad -3k^2 - 6k + 9 = 0$$

$$-3(k^2 + 2k - 3) = 0$$

$$k = -3$$

$$k_{1,2} = \frac{-1 \pm \sqrt{1+3}}{1} = \begin{matrix} -3 \\ 1 \end{matrix}$$

$$k = 1 \text{ NO}$$