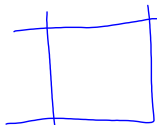
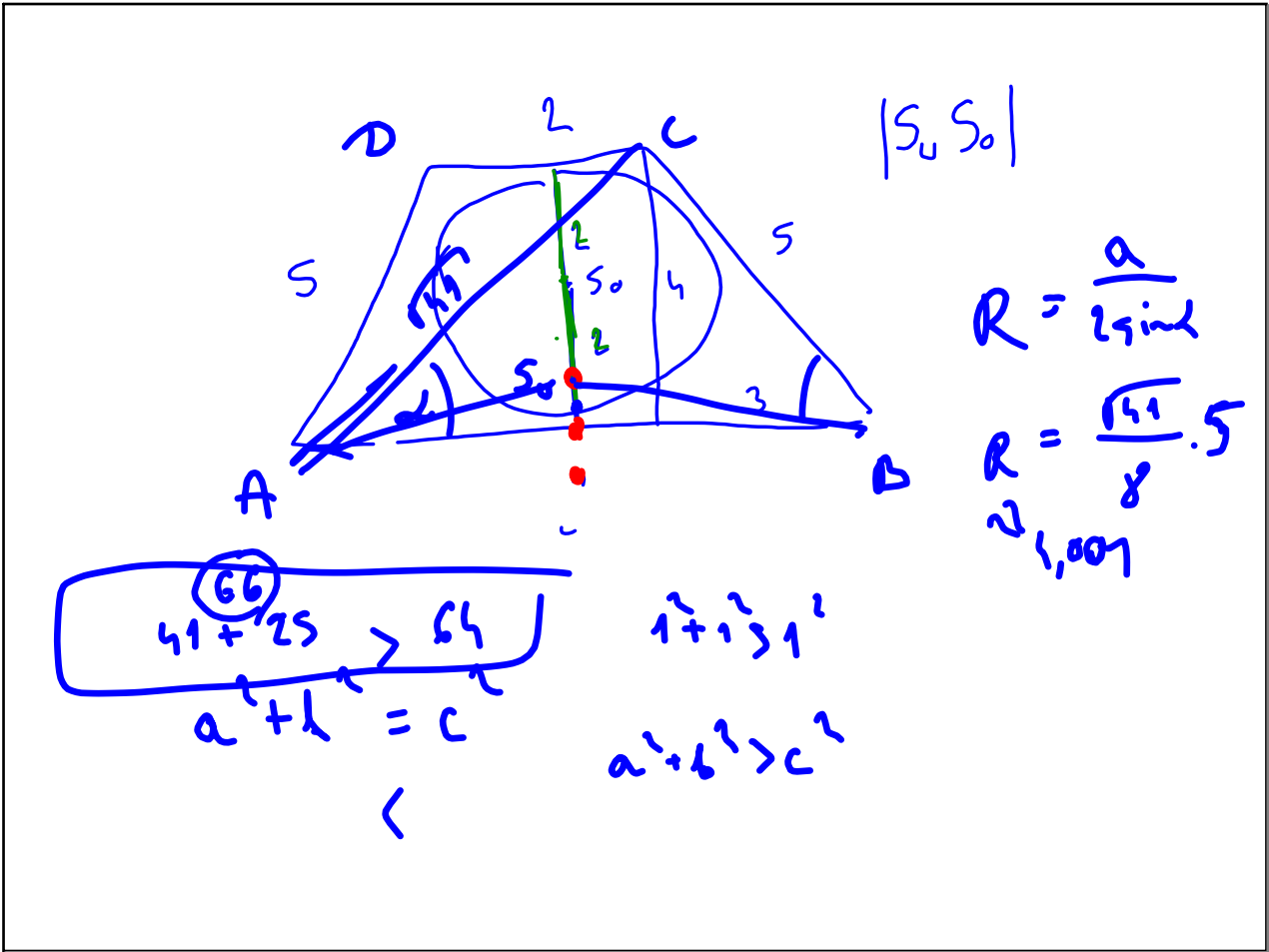
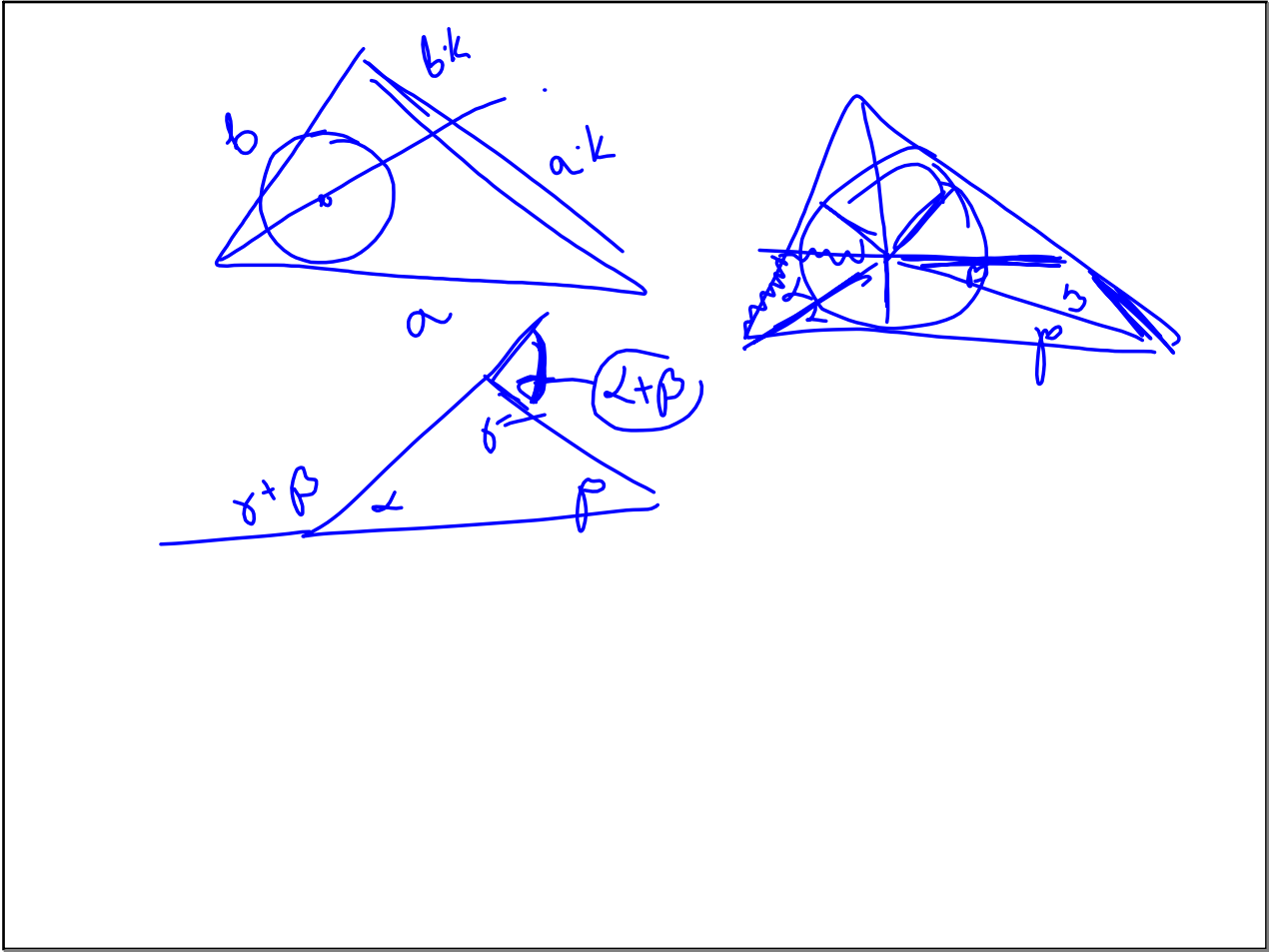


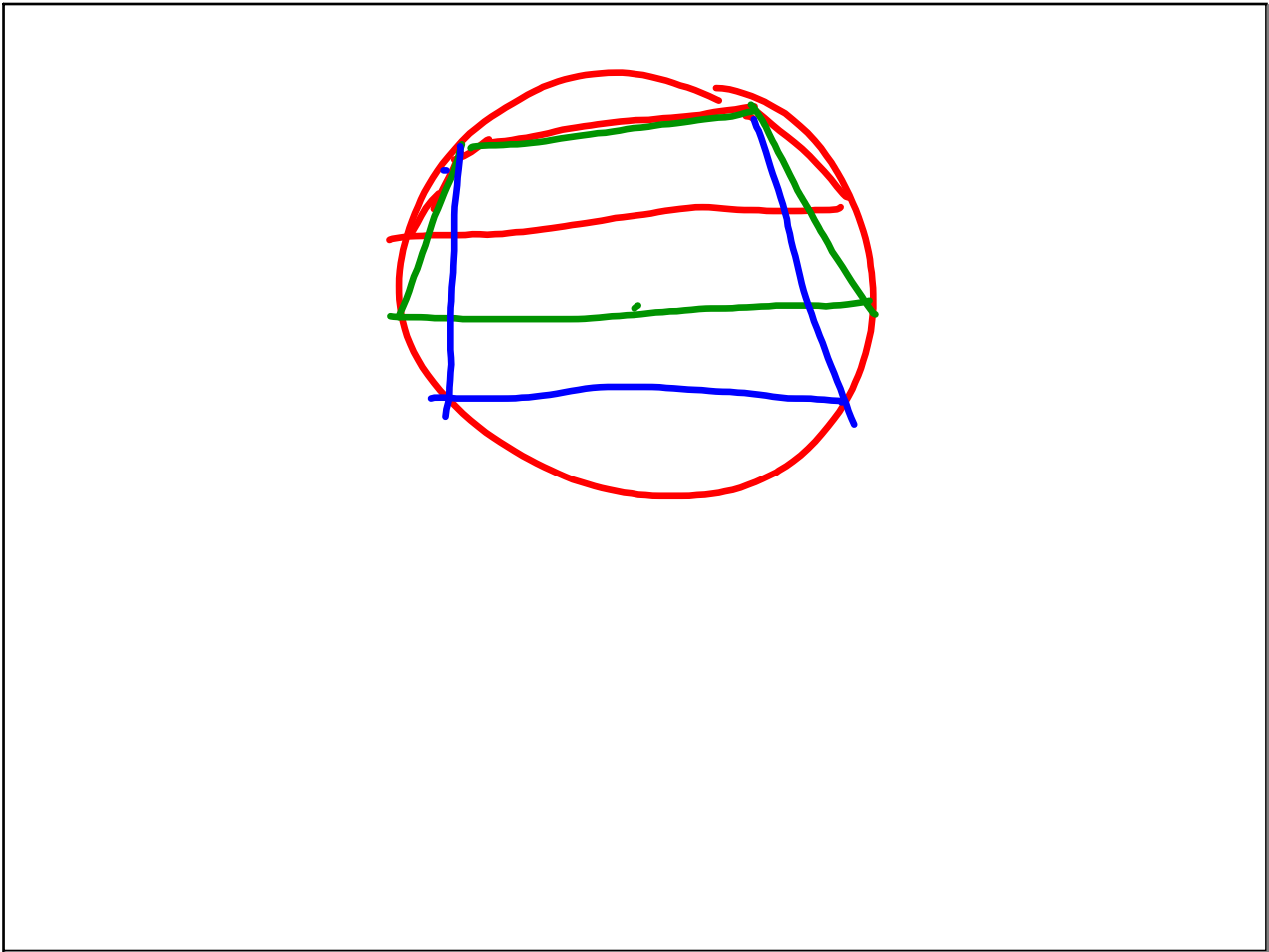
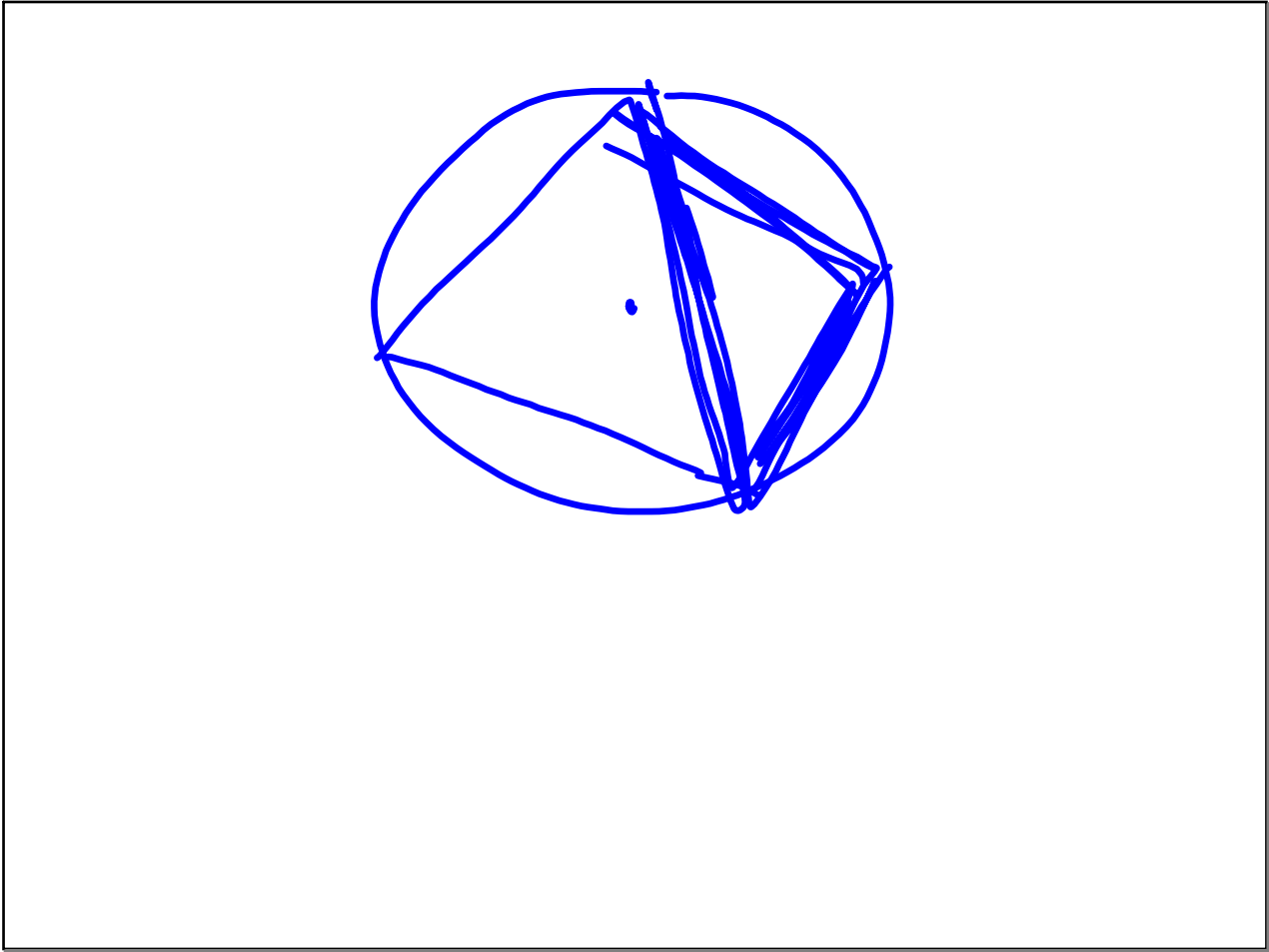
P. d. f.
 $K+ -$
 $\Gamma+ -$
 $1, \cancel{2}, 1 \quad K-$
 $(2, 1) = \{12\}$


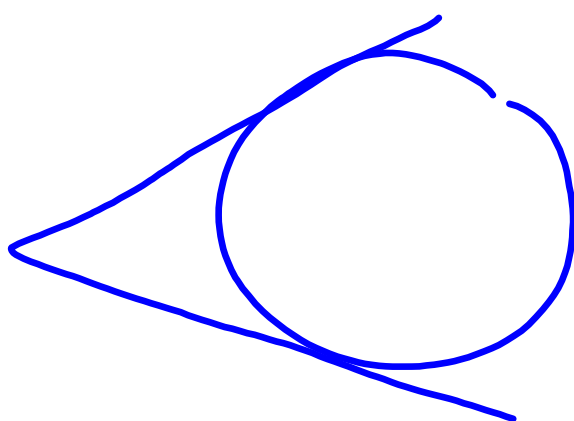
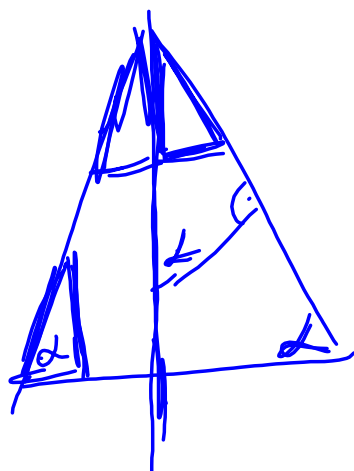
 $\cancel{2}, 1 \quad 9$
 $1 \dots 9$
 $9 \quad 8 \quad 7 \quad V_9^3 = \frac{9!}{6!}$
 $\frac{(9)}{(3)} \cdot 3! = V_9^3 = \frac{9!}{6!}$
 $x + y + z = 10$
 $\dots - | - - - | - - -$
 $\dots \quad] \quad] \quad]$
 $\frac{21}{25}$
 $\Omega -$
 $A - \quad \bar{\Omega}$
 $B -$
 $A \cap B -$
 $P(A/B) = \frac{\overline{A \cap B}}{B} \quad \left(\frac{2}{3} \right) = 3$
 $\text{C} \quad a$

Hand-drawn sketches of various geometric shapes and symbols:

- A large triangle with internal lines and labels α_1 , α_2 , and α_3 .
- A small triangle with a dot inside.
- A triangle with a shaded area on its left side.
- A large empty triangle.
- A rounded rectangle containing the equation $\alpha = \beta$.
- A circle containing the expression $F_1 \sim F_2$.
- A circle containing a triangle with a diagonal line through it.
- A circle containing two horizontal lines intersected by a diagonal line, with labels x and y near the intersection points.
- The text "sym" followed by a vertical line and "as".

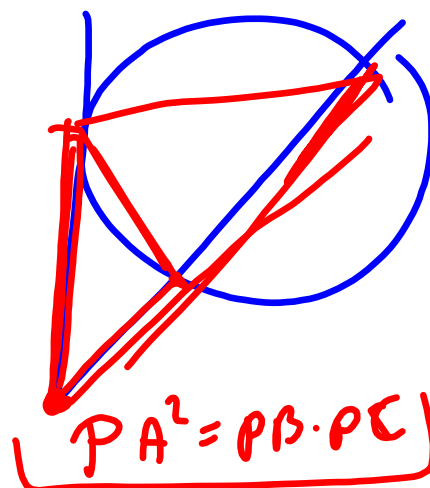






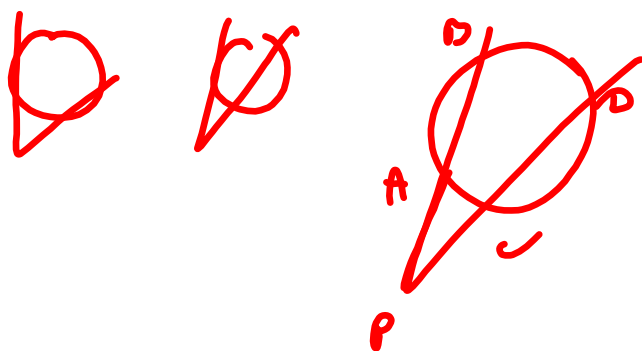
$$\frac{PA}{PB} = \frac{PC}{PA}$$

... →



$$PA^2 = PB \cdot PC$$

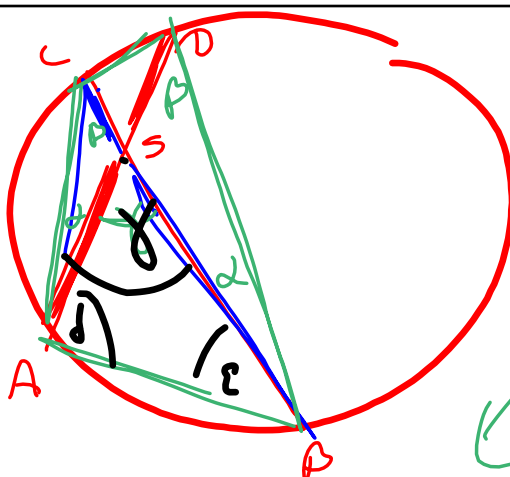




$$PA \cdot PB = PC \cdot PD$$

$$\gamma = \angle + \rho$$

$$\gamma = 180^\circ - (\delta + \epsilon)$$

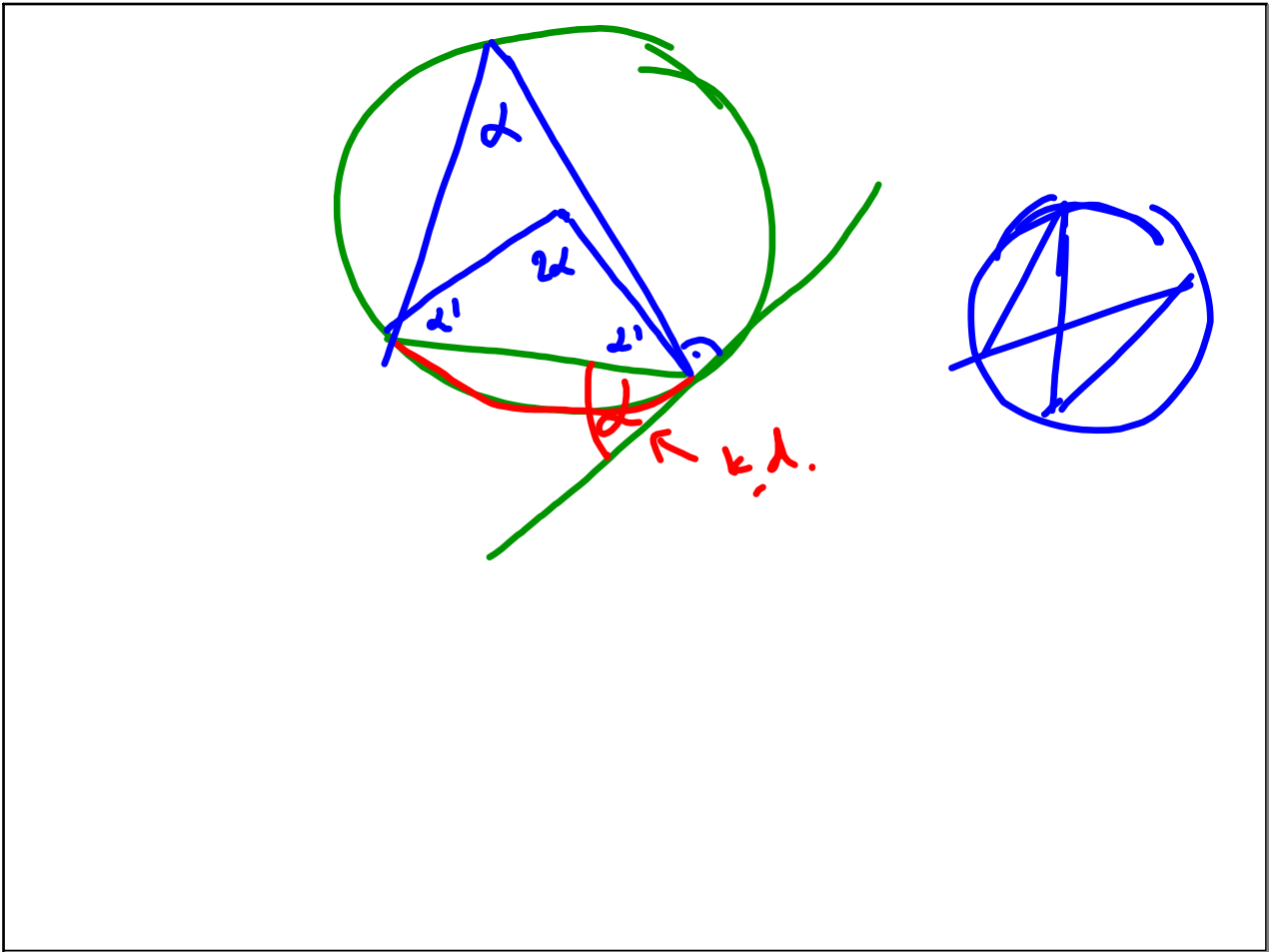
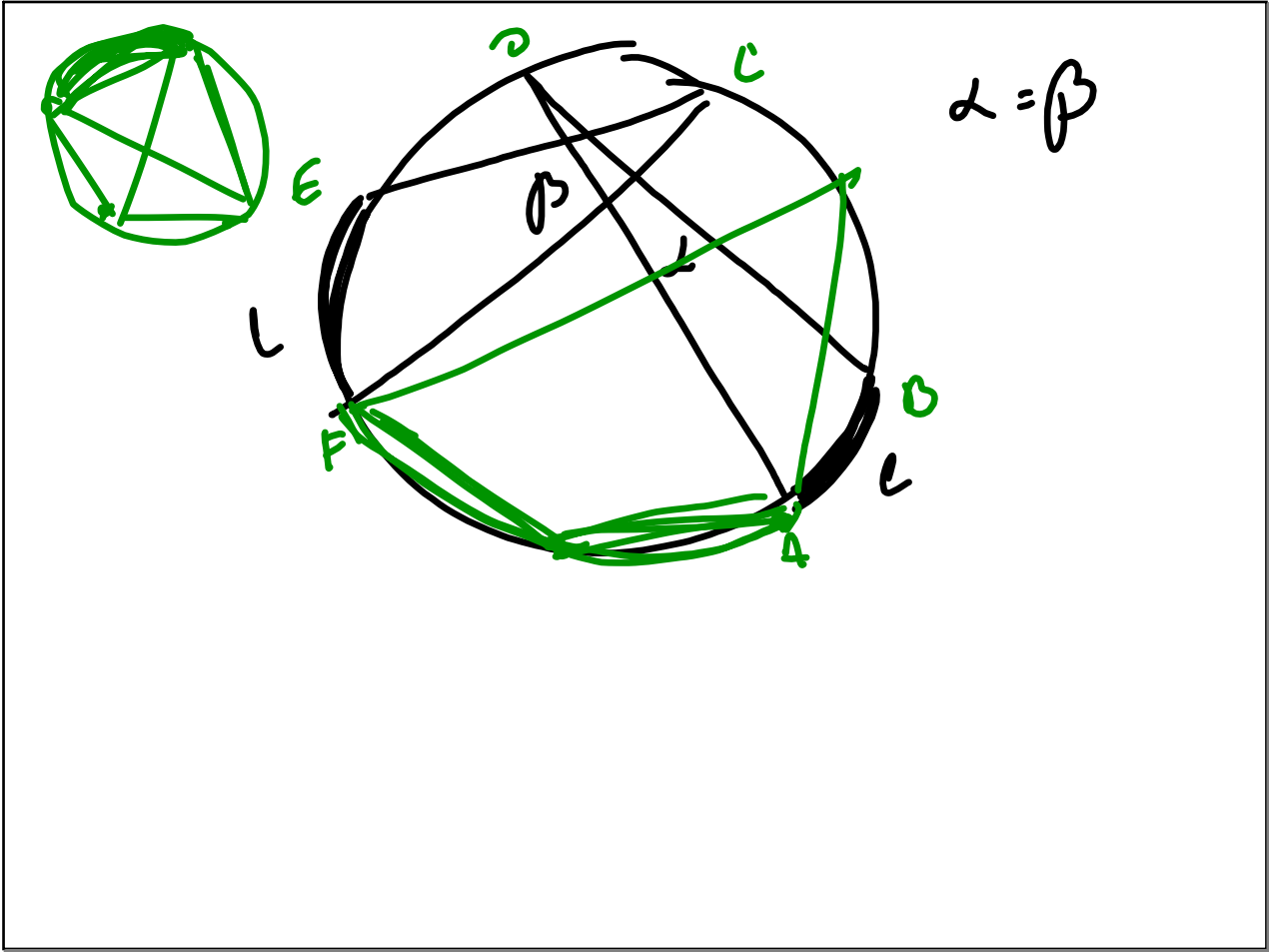


$$AS \cdot SD =$$

$$BS \cdot CS$$

$$\triangle BSD \sim \triangle ASC$$

$$\frac{AS}{SB} = \frac{CS}{SD}$$



$$\log_a b^2 = 2 \log_a |b| \quad b \neq 0$$

$$\log_a b = \frac{1}{n} \log_a b = \log_a b^{\frac{1}{n}}$$

$$\log_a b = \frac{1}{\log_b a}$$

$$\log_a b \cdot \log_b c = \log_a c$$

$$\log_a b \cdot \frac{\log_a c}{\log_a b} = \log_a c$$

$$(a^b)^c = (a^c)^b$$

$$Z: 2^a + 2^{-a} = 3 \quad | ()^2$$

$$P: \underbrace{4^a + 4^{-a}} \in \mathbb{Z}$$

$$4^a + 2 + 4^{-a} = 9$$

$$(2^a + 2^{-a})^2 - 2$$

$$\sin(x+p) + \sin(x-p) -$$

$$\sin x + \sqrt{3} \cos x$$

$$y = \sqrt{\sin x + \cos x}$$

$$y = 2^u \quad u \in (-r_1, r_1)$$

$$y = 2^u \quad u \in (-r_1, r_1)$$

$$y \in (2^{-r_1}, 2^{r_1})$$

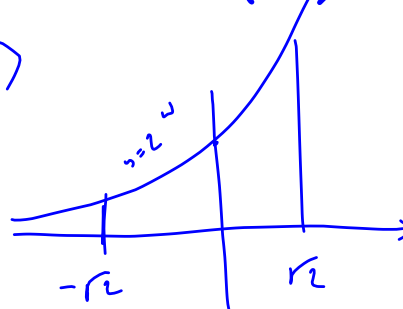
$$2^{1,41}$$

$$u(x) = \sin(x+p) + \sin(x-p) =$$

$$\sqrt{2} \left(\frac{\sqrt{2}}{2} \sin x + \frac{\sqrt{2}}{2} \cos x \right) =$$

$$\sqrt{2} (\sin(x+p))$$

$$r_1 = 1,41$$



Czas połowicznego rozpadu pierwiastka to okres, jaki jest potrzebny, by ze 100% pierwiastka pozostało 50% tego pierwiastka. Oznacza to, że ilość pierwiastka pozostała z każdego grama pierwiastka po x okresach

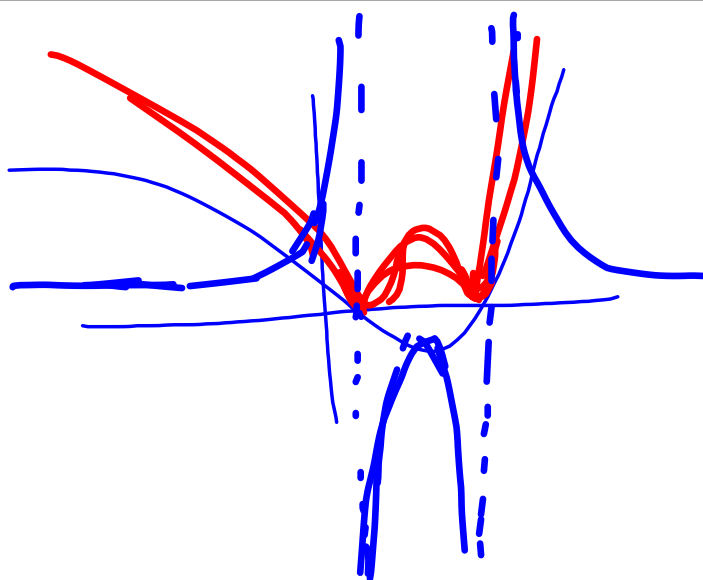
rozpadu połowicznego wyraża się wzorem $y = \left(\frac{1}{2}\right)^x$. W przypadku izotopu jodu ^{131}I czas połowicznego rozpadu

jest równy 8 dni. Wyznacz najmniejszą liczbę dni, po upływie których pozostanie z $1\text{g } ^{131}\text{I}$ nie więcej niż 0,125g tego pierwiastka.

$$3 \cdot 8 = 24$$

$$\frac{1}{8} = \left(\frac{1}{2}\right)^3$$

$$\begin{array}{l} f(x) \\ (f(x))^2 \\ \sqrt[22]{f(x)} \\ |f(x)| \\ \frac{1}{f(x)} \end{array}$$



$\mathbb{D}_f: x \in (-\infty, x_0) \cup (x_0, x_1) \cup (x_1, +\infty)$
 (with arrows pointing to x_0 and x_1 labeled "pion" and "pion")

$\lim_{x \rightarrow x_0} f(x) = \pm\infty \Rightarrow$ as pion $x = x_0$
 $\lim_{x \rightarrow x_1} f(x) = \pm\infty \Rightarrow$ as pion $x = x_1$

$\lim_{x \rightarrow \pm\infty} f(x) = a \Rightarrow$ as pion $y = a$

$\lim_{x \rightarrow \pm\infty} f(x) = \pm\infty \Rightarrow$ sprak ulosiny

$a = \lim_{x \rightarrow \pm\infty} \frac{f(x)}{x} \neq 0$

$y = ax + b$
 $b = \lim_{x \rightarrow \pm\infty} (f(x) - ax) \neq 0$

$f(x)$ - ymiani $\Rightarrow$ as pion $\Leftrightarrow stl = stM$
 as pion $\Leftrightarrow stl < stM$
 as ulos $\Leftrightarrow stl = stM + 1$

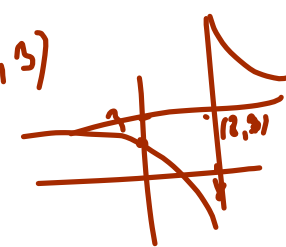
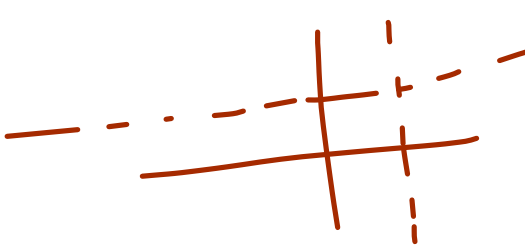
$\frac{x^3+2}{x^2+1} \rightarrow +\infty$
 $x \rightarrow +\infty$

$\frac{x^3+2}{x^3+x} \rightarrow 1 = a$

$f(x) = \frac{qx+r}{x-p} = \frac{q(x-p) + r - qp}{x-p} =$
 $= \frac{r-qp}{x-p} + q = \frac{a}{x-p} + q$

$f(x) = \frac{3x-5}{x-8}$
 $x \neq 8$

$S(8, 3)$

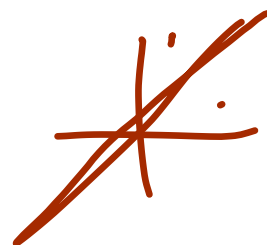



$f(x) = x^2 + 7x$ $u(-4, 9)$
 $\downarrow [-3, 0]$ $u_1(-7, 9)$
 $f(\underline{x+3})$ $u_2(7, 9)$ ←
 $\downarrow \text{Sor}$
 $f(\underline{-x+3})$ $u_3(10, 9)$
 $\downarrow [3, 0]$
 $f(-(x-3)+3) = f(-x+6) = (-x+6)^2 + 7(-x+6)$
 $x^2 - 12x + 36 - 7x + 42$
 $x^2 - 19x + 78$
 $(x=10)$

$f(x) = x^2 + 2x$
 $\downarrow$
 $f(x) - 2$
 $\downarrow \text{Sor}$
 $-(f(x) - 2)$
 $\downarrow [0, 2]$
 $-f(x) + 2 + 2 = -f(x) + 4$

$$f(x) \xrightarrow{S_{(0,0)}} -f(-x)$$

$$y = f(x) \xrightarrow{S_{y=x}} x = f(y)$$



$$\vec{u} = [x_n, y_n] = x_n \left[1, \left(\frac{y_n}{x_n} \right) \right]$$

$$\underline{[1, a]} \parallel \underline{y = ax + b}$$



$$\vec{u} = [3, 5] \quad C(8, 2)$$

$$3[1, \frac{5}{3}] \rightarrow -\frac{3}{5} \perp$$

$$\vec{u} \parallel K \wedge C \in K \Rightarrow K: y = \frac{5}{3}(x-8) + 2$$

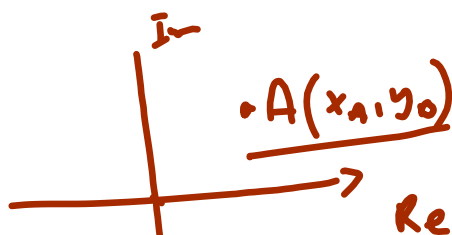
$$\vec{u} \perp L \wedge C \in L \Rightarrow L: y = -\frac{3}{5}(x-8) + 2$$

$$[3, 5] \parallel 5x - 3y + C = 0$$

$$\vec{AB} = B - A$$

$$i = \sqrt{-1}$$

$$\boxed{A = \vec{OA}}$$



$$\vec{AB} = \vec{AO} + \vec{OB} = \vec{OB} - \vec{OA} = B - A$$

$$\underline{B = A + \vec{AB}}$$

$$\underline{f(x) \xrightarrow{(p, q)} f(x-p) + q}$$

Z:

T: $\sqrt{2} \in \mathbb{Q} \setminus \mathbb{Q}$

$$D: \text{Hp } \sqrt{2} \in \mathbb{Q} \Rightarrow \sqrt{2} = \frac{p}{q} \quad p, q \in \mathbb{Z}_+ \quad q \neq 0$$

$$\textcircled{2.1} \quad \text{NWD}(p, q) = 1$$

$$q\sqrt{2} = p \quad |()^2$$

$$2q^2 = p^2 \Rightarrow 2|p \Rightarrow p = 2m$$

$$2q^2 = 4m^2$$

$$q^2 = 2m^2 \Rightarrow 2|q \quad \rightarrow \text{spr. 2 i 2a } \text{gcd}(p, q) \neq 1$$

$$\Downarrow$$

$$\text{Hp i t fa} \Rightarrow$$

$$T \sim iA \quad \text{---}$$

$$am^2 + bm$$

$$\textcircled{c=0}$$

$$S_n = n^2 - 2n$$

$$\textcircled{a_n} \text{ abg.}$$

$$\begin{cases} a_1 = S_1 \\ a_n = S_n - S_{n-1} \\ \quad \underline{n \geq 1} \end{cases}$$

$$\boxed{a_m^2 + b_m + c} \leftarrow$$

$$a_1 \neq s_1$$

$$\boxed{a_n = s_n - s_{n-1}} - c \text{ ul}$$

$$\frac{r = a_n - a_{n-1} \in \mathbb{R}}{q = \frac{a_n}{n} \in \mathbb{R}}$$

$$s_n = n^2 - 3n + 1 \quad \boxed{a_1 = 0}$$

$$s_n = n^2 - 3n$$

$$\boxed{a_1 = -2}$$

$$\left(\frac{ax+b}{cx+d} \right)' = \frac{\text{const}}{(cx+d)^2}$$

3.09.2018

THE

END

2021.04.30