

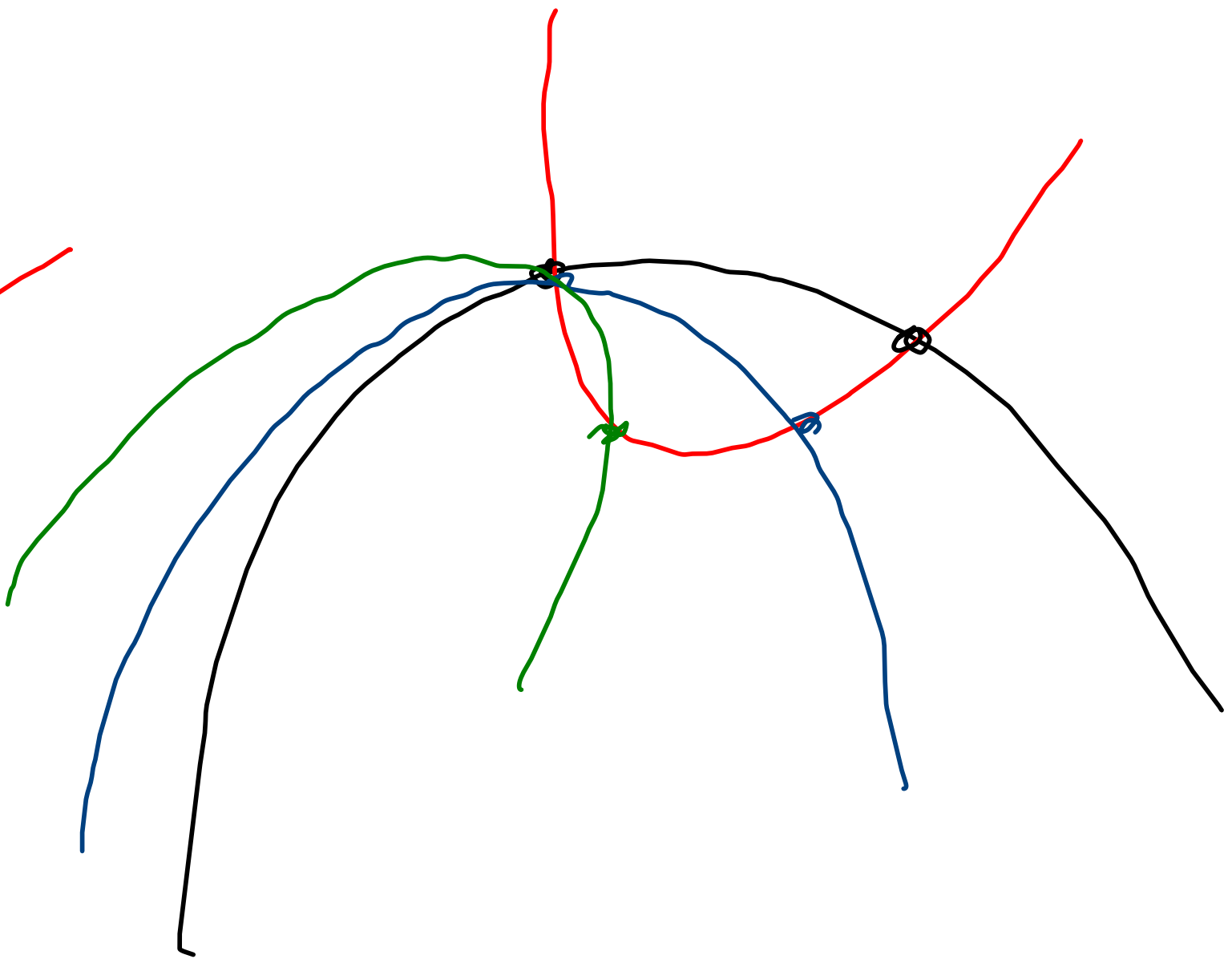
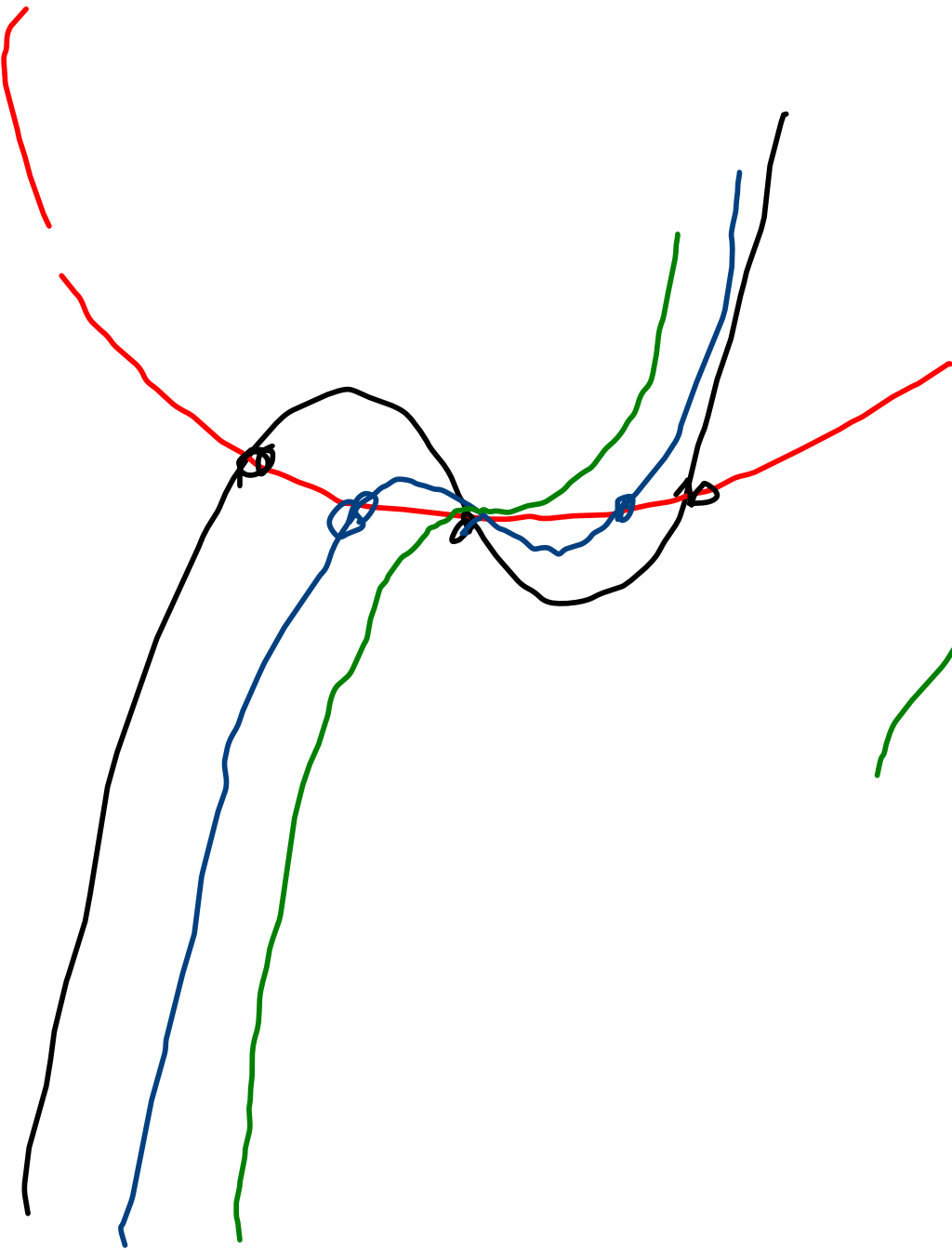
$$f(x) = \cancel{f'(0)x} + \cancel{\frac{1}{2}f''(0)x^2} + \dots + \cancel{\frac{1}{n!}f^{(n)}(0)x^n} + \frac{1}{(n+1)!}f^{(n+1)}(0)x^{n+1} + \dots$$

$$g(x) = \cancel{g'(0)x} + \cancel{\frac{1}{2}g''(0)x^2} + \dots + \cancel{\frac{1}{n!}g^{(n)}(0)x^n} + \frac{1}{(n+1)!}g^{(n+1)}(0)x^{n+1} + \dots$$

$f(x) = 0$ $g(x) = 0$
 contatto di
 ordine n in 0

$$f(x) - g(x) = \frac{1}{(n+1)!} \left(f^{(n+1)}(0) - g^{(n+1)}(0) \right) x^{n+1} + \dots$$

$\neq 0$



$C \equiv (\alpha, \beta)$ Raggio R

$$(x - \alpha)^2 + (y - \beta)^2 - R^2 = 0$$

$$x^2 - 2\alpha x + y^2 - 2\beta y + \alpha^2 + \beta^2 - R^2 = 0$$

$$x^2 + y^2 + ax + by + c = 0$$

$$\alpha = -\frac{a}{2} \quad \beta = -\frac{b}{2} \quad R^2 = \alpha^2 + \beta^2 - c$$

$$\mathbb{C}^2 : \begin{cases} y = x^2 \\ x = u \\ y = u^2 \end{cases}$$

$$0 \Leftrightarrow u = 0$$

$$x^2 + y^2 + ax + by + c = 0$$

$F(x, y)$

$$\Phi(u) = u^2 + u^4 + au + bu^2 + c$$

$$\Phi'(u) = 2u + 4u^3 + a + 2bu$$

$$\Phi''(u) = 2 + 12u^2 + 2b$$

$$\Phi'''(u) = 24u$$

$$\Phi^{(4)}(u) = 24$$

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$$0 \leftrightarrow u = 0$$

$$\begin{aligned} & c \\ & a \\ & 2 + 2b \\ & 0 \\ & 24 \end{aligned}$$

$$\left. \begin{aligned} \Phi(0) &= 0 \\ \Phi'(0) &= 0 \\ \Phi''(0) &= 0 \end{aligned} \right\} \begin{aligned} c &= 0 \\ a &= 0 \\ b &= -1 \end{aligned}$$

$$\boxed{x^2 + y^2 - y = 0}$$

Centro $\equiv (0, \frac{1}{2})$ $R = \frac{1}{2}$

Fuoco $\equiv (0, \frac{1}{4})$

$$\boxed{\begin{aligned} y &= \frac{1}{4b} x^2 \\ \text{Fuoco:} & \\ & (0, b) \end{aligned}}$$

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$$\Phi'''(u) = 24u$$

$$\Phi^{(4)}(u) = 24$$

$$P \equiv (1,1) \Leftrightarrow u = 1$$

$$2 + a + b + c$$

$$6 + a + 2b$$

$$14 + 2b$$

$$24$$

$$24$$

$$\begin{cases} \Phi(1) = 0 \\ \Phi'(1) = 0 \\ \Phi''(1) = 0 \end{cases}$$

$$a + b + c = -2$$

$$a + 2b = -6$$

$$2b = -14$$

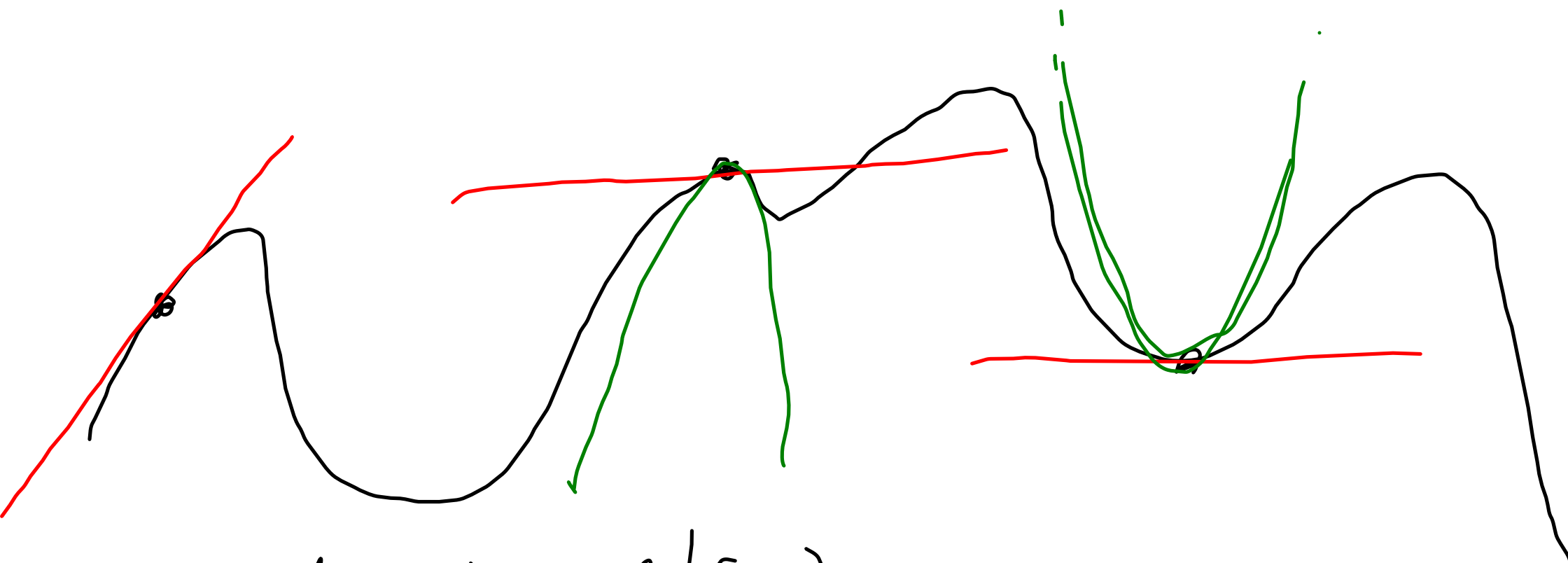
$$c = -2 - 8 + 7 = -3$$

$$a = -6 + 14 = 8$$

$$b = -7$$

$$x^2 + y^2 + 8x - 2y - 3 = 0$$

$$C \equiv \left(-4, \frac{7}{2}\right) \quad R^2 = 16 + \frac{49}{4} + 3$$



$$y = f(x_0) + f'(x_0)x$$

$$y = f(x_0) + f'(x_0)x + \frac{1}{2}f''(x_0)x^2$$

