

1) $a y^2 - 2(a-1)y - 2x + 1 + a = 0$ INDIVIDUARE LE PRINCIPALI CARATTERISTICHE

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

$$\begin{cases} y^2 - 2y + 1 = 0 \\ 2y = 2x - 1 \end{cases} \begin{cases} (y-1)^2 = 0 \\ z = 2x - 1 \end{cases} \begin{cases} y = 1 \\ x = \frac{3}{2} \end{cases} \left(\frac{3}{2}, 1\right)$$

Tutte le parabole tangenti alla retta $2y - 2x + 1 = 0$ nel punto $\left(\frac{3}{2}, 1\right)$.

2) Determina la retta che passa per $(2; 2)$

$$a(2)^2 - 2(a-1)2 - 4 + 1 + a = 0$$

$$4a - 4a + 4 - 4 + 1 + a = 0 \quad \boxed{a = -1}$$

$$-y^2 + 2y - 1 + 2y - 2x + 1 = 0 \quad y^2 - 4y + 2x = 0$$

$$y: x = -\frac{1}{2}y^2 + 2y \quad V(2; 2)$$

3) eq. α, β tangenti a γ in A e B int con asse ordinato

$$A, B \begin{cases} x=0 \\ -\frac{1}{2}y^2 + 2y = 0 \end{cases} \begin{cases} x=0 \\ y(-\frac{1}{2}y + 2) = 0 \end{cases} \begin{matrix} \rightarrow y=0 \\ \rightarrow y=4 \end{matrix} \quad A(0; 0) \quad B(0; 4)$$

$$r: \text{Tg in } A(0;0) \text{ e } y: \frac{x+x_A}{2} = -\frac{1}{2} y y_A + 2 \frac{y+y_A}{2}$$

$$\frac{x}{2} = y \quad \boxed{x-2y=0} \quad r$$

$$s: \text{Tg in } B(0;4) \text{ e } y: \frac{x+x_B}{2} = -\frac{1}{2} y y_B + 2 \frac{y+y_B}{2}$$

$$\frac{x}{2} = -\frac{1}{2} y \cdot 4 + y + 4 \Rightarrow$$

$$\boxed{x+2y-8=0} \quad s$$

3) Eq C Tg alla parabola in A e B:
 C € retta $y=2$

C(2;2) $m_{CB} \perp m_s$

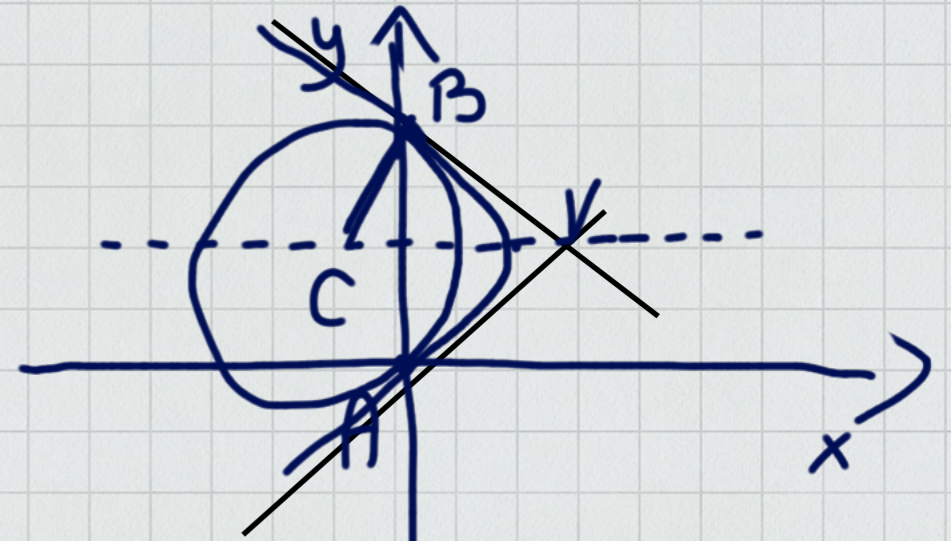
$$m_{CB} = \frac{y_C - y_B}{x_C - x_B} = \frac{2-4}{2-0} = -\frac{2}{2}$$

$$m_s = -\frac{1}{2} \quad -\frac{2}{-\frac{1}{2}} = 2$$

$$d = -1 \quad \overline{CB}^2 = 1+4 = 5$$

C(-1;2) $(x+1)^2 + (y-2)^2 = 5$ $x^2 + 1 + 2x + y^2 + 4 - 4y - 5 = 0$

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



4) retta // $x=0$ che interseca l_2 e l_1 in $P \in Q$ e l_2 e l_1 in $C \in D$ in modo che $\overline{CD} = \sqrt{2} \overline{PQ}$

$$x=k \quad \begin{cases} x=k \\ (x+1)^2 + (y-2)^2 = 5 \end{cases} \quad \begin{cases} x=k \\ y = 2 \pm \sqrt{5 - (k+1)^2} \end{cases} \quad P(k; 2 - \sqrt{5 - (k+1)^2})$$

$$Q(k; 2 + \sqrt{5 - (k+1)^2}) \quad PQ = \sqrt{(k-k)^2 + (2 - \sqrt{5 - (k+1)^2} - 2 - \sqrt{5 - (k+1)^2})^2} = |2\sqrt{5 - (k+1)^2}|$$

$$C; D \quad \begin{cases} x=k \\ x = -\frac{1}{2}y^2 - 2y \end{cases} \quad \begin{cases} x=k \\ -\frac{1}{2}y^2 - 2y - k = 0 \end{cases} \quad \begin{cases} x=k \\ y = \frac{1 \pm \sqrt{1 - \frac{k}{2}}}{-\frac{1}{2}} \end{cases}$$