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$$y = (k^2 - 1)x^2 + x - k - 3$$

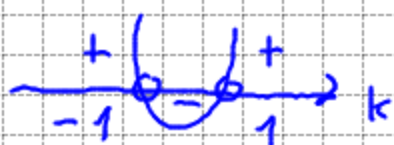
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a) Rappresenta una parabola rivolta verso l'alto

$$k^2 - 1 > 0 \quad \text{eq. en.}$$

$$k^2 - 1 = 0$$

$$k = \pm 1$$



$$k < -1 \vee k > 1$$

b) Rappresenta una parabola che passa per l'origine

$$c = 0$$

$$-k - 3 = 0$$

$$k = -3$$

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$v(0;0)$ $y=0$ asse di simmetria

$P \in d$ $P(2;4)$

$$x = ay^2 + by + c$$

$$d: X=2 \quad \begin{cases} -\frac{1+\Delta}{4a} = 2 \\ -\frac{b}{2a} = 0 \\ c = 0 \end{cases} \quad \begin{cases} b=0 \\ c=0 \\ -1 = 8a \end{cases} \quad \begin{cases} a = -\frac{1}{8} \\ b=0 \\ c=0 \end{cases}$$

$$x = -\frac{1}{8}y^2$$

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$$y = 2 + \sqrt{x+2}$$

$$y - 2 = \sqrt{x+2}$$

$$x+2 \geq 0$$

$$x \geq -2$$

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

$$\begin{cases} (y-2)^2 = x+2 \end{cases}$$

$$\begin{cases} x \geq -2 \\ y \geq 2 \end{cases}$$

$$\begin{cases} y^2 - 4y + 4 = x+2 \end{cases}$$

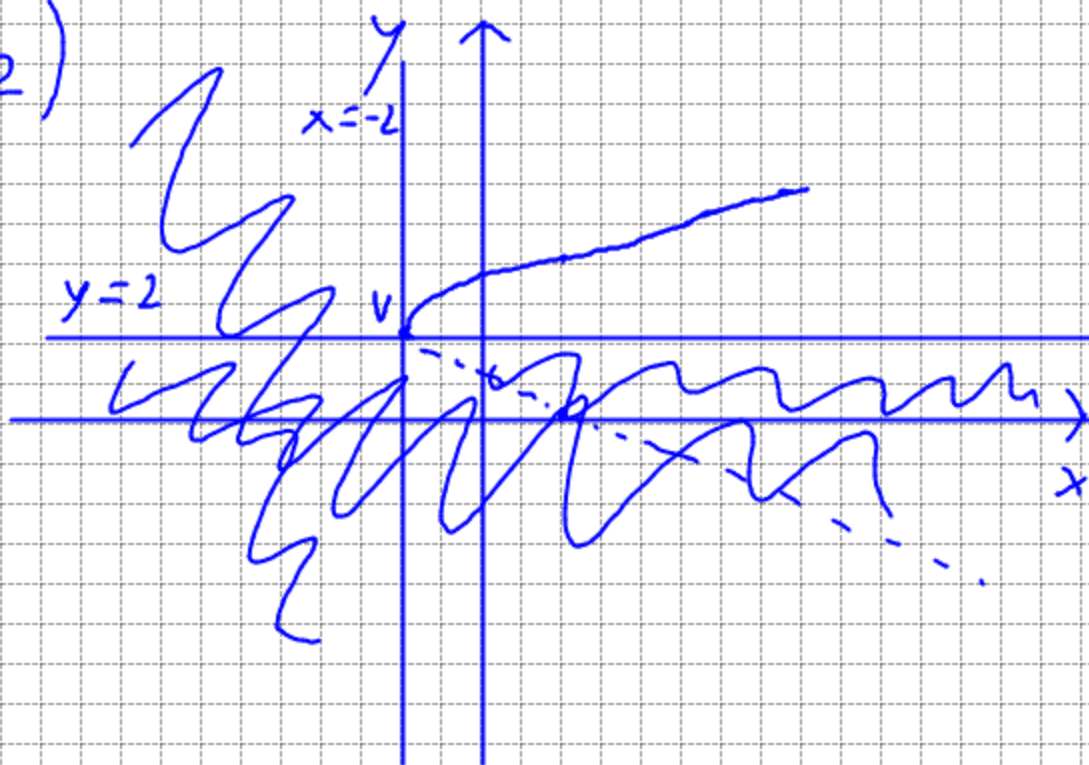
$$\begin{cases} x \geq -2 \\ y \geq 2 \end{cases}$$

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

$$v\left(-\frac{\Delta}{4a}; -\frac{b}{2a}\right)$$

$$\frac{-16+8}{4} = -\frac{8}{4} = -2$$

$$v(-2; 2)$$



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$$y = 3x + 1$$

$$y = x^2 + 4x - 1$$

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$$\begin{cases} y = 3x + 1 \\ y = x^2 + 4x - 1 \end{cases}$$

$$\begin{cases} y = 3x + 1 \\ 3x + 2 = x^2 + 4x - 1 \end{cases}$$

$$\begin{cases} y = 3x + 1 \\ x^2 + x - 2 = 0 \end{cases}$$

$$x_{1,2} = \frac{-1 \pm \sqrt{1+8}}{2} =$$

$$= \frac{-1 \pm 3}{2} = \begin{cases} x_1 = -2 \\ x_2 = 1 \end{cases}$$

$$\begin{cases} x_1 = -2 \\ y_1 = -5 \end{cases} \quad \begin{cases} x_2 = 1 \\ y_2 = 4 \end{cases}$$

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$$y = x^2 - 2x + 7$$

$$r: y = 2x - 1$$

$$v\left(-\frac{b}{2a}; -\frac{\Delta}{4a}\right)$$

$$v(1; 6)$$

$$m_s = m_r = 2$$

$$y - 6 = 2(x - 1)$$

$$y - 6 = 2x - 2$$

$$y = 2x + 4$$

$$\begin{cases} y = 2x + 4 \\ y = x^2 - 2x + 7 \end{cases}$$

$$y = x^2 - 2x + 7$$

$$\begin{cases} y = 2x + 4 \\ 2x + 4 = x^2 - 2x + 7 \end{cases}$$

$$2x + 4 = x^2 - 2x + 7$$

$$\begin{cases} y = 2x + 4 \\ x^2 - 4x + 3 = 0 \end{cases}$$

$$x_{1,2} = 2 \pm \sqrt{4-3} =$$
$$= 2 \pm 1 = \begin{cases} x_1 = 1 \\ x_2 = 3 \end{cases}$$

$$\begin{cases} x_1 = 1 \\ y_1 = 6 \end{cases}$$

$$\begin{cases} x_2 = 3 \\ y_2 = 10 \end{cases}$$