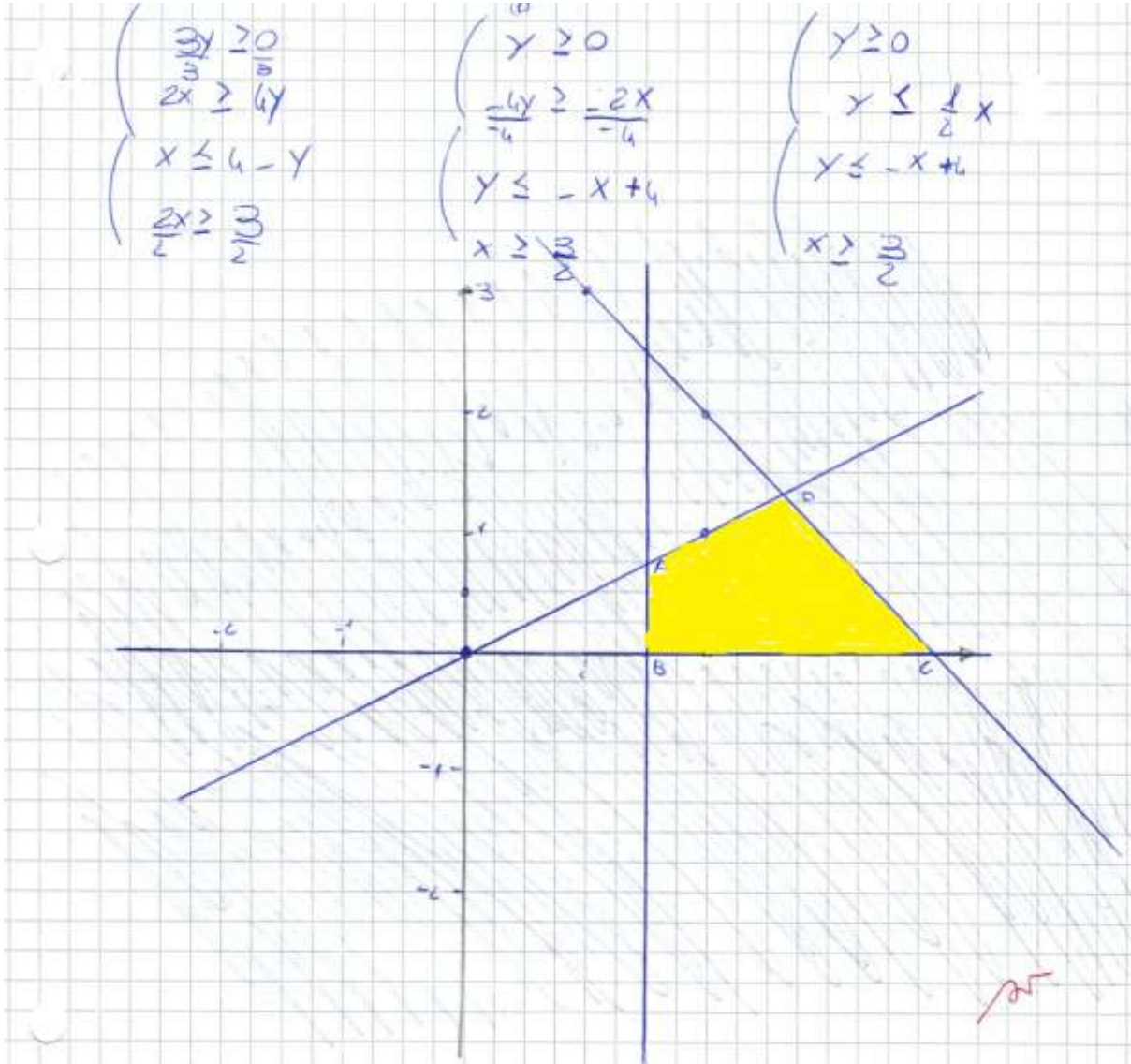


1) Rappresenta le soluzioni del seguente sistema sul piano cartesiano e calcola le coordinate dei vertici della relativa regione:

$$\begin{cases} 3y \geq 0 \\ 2x \geq 4y \\ x \leq 4 - y \\ 2x \geq 3 \end{cases}$$



$$\begin{array}{l} y \geq 0 \\ \hline x \quad y \\ 1 \quad 0 \\ 2 \quad 0 \end{array}$$

$$\begin{array}{l} y \leq \frac{1}{2}x \\ \hline x \quad y \\ 0 \quad 0 \\ 2 \quad 1 \end{array}$$

$$\begin{array}{l} y \leq -x + 4 \\ \hline x \quad y \\ 1 \quad 3 \\ 2 \quad 2 \end{array}$$

$$\begin{array}{l} x \geq \frac{3}{2} \\ \hline x \quad y \\ \frac{3}{2} \quad 1 \\ \frac{3}{2} \quad 0 \end{array}$$

Punto A:

$$\begin{cases} x = \frac{3}{2} \\ y = \frac{1}{2}x \end{cases}$$

$$\begin{cases} x = \frac{3}{2} \\ y = \frac{1}{2} \cdot \frac{3}{2} \end{cases}$$

$$\begin{cases} x = \frac{3}{2} \\ y = \frac{3}{4} \end{cases}$$

$$A\left(\frac{3}{2}; \frac{3}{4}\right)$$

PUNTO B:

$$\begin{cases} y=0 \\ x=\frac{12}{2} \end{cases} \quad B\left(\frac{12}{2}; 0\right)$$

PUNTO C:

$$\begin{cases} y=0 \\ y=-x+4 \end{cases} \quad \begin{cases} y=0 \\ x=0+4 \end{cases} \quad \begin{cases} y=0 \\ x=4 \end{cases} \quad C(4; 0)$$

PUNTO D:

$$\begin{cases} y=-x+4 \\ y=\frac{1}{2}x \end{cases} \quad \begin{cases} y=\text{idem} \\ -x+4=\frac{1}{2}x \end{cases} \quad \begin{cases} \text{idem} \\ -x+4-\frac{1}{2}x=0 \end{cases} \quad \begin{cases} \text{idem} \\ \frac{-2x+8-x}{2}=\frac{0}{2} \end{cases}$$

$$\begin{cases} \text{idem} \\ \frac{-3x}{2}=\frac{-8}{2} \end{cases} \quad \begin{cases} \text{idem} \\ x=\frac{8}{3} \end{cases} \quad \begin{cases} y=\frac{-8}{3}+4 \\ x=\frac{8}{3} \end{cases} \quad \begin{cases} y=\frac{-8+12}{3} \\ x=\frac{8}{3} \end{cases}$$

$$\begin{cases} y=\frac{4}{3} \\ x=\frac{8}{3} \end{cases} \quad D\left(\frac{8}{3}; \frac{4}{3}\right)$$

2) Dopo aver determinato l'equazione della parabola con asse parallelo all'asse y, passante per i punti A(1;0) B(-1;-4) C(2;-1), calcolane le coordinate del vertice e delle intersezioni con gli assi cartesiani.

$$A(1;0) \quad B(-1;-4) \quad C(2;-1)$$

$$\begin{cases} 0 = a + b + c \\ -4 = a - b + c \\ -1 = 4a + 2b + c \end{cases} \quad \begin{cases} a = -b - c \\ -4 = -b - c - b + c \\ -1 = 4(-b - c) + 2b + c \end{cases} \quad \begin{cases} a = -b - c \\ -4 = -2b \\ -1 = -4b - 4c + b + c \end{cases}$$

$$\begin{cases} a = -b - c \\ \frac{2b}{2} = \frac{4}{2} \\ -1 = -2b - 3c \end{cases} \quad \begin{cases} a = -b - c \\ b = 2 \\ -1 = -2(2) - 3c \end{cases} \quad \begin{cases} a = -b - c \\ b = 2 \\ -1 = -4 - 3c \end{cases}$$

$$\begin{cases} a = -b - c \\ b = 2 \\ \frac{3c}{3} = \frac{-3}{3} \end{cases} \quad \begin{cases} a = -2 + 1 \\ b = 2 \\ c = -1 \end{cases} \quad \begin{cases} a = -1 \\ b = 2 \\ c = -1 \end{cases}$$

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

INT. CON ASSE X

$$\begin{cases} y=0 \\ y = -x^2 + 2x - 1 \end{cases} \quad \begin{cases} y=0 \\ 0 = -x^2 + 2x - 1 \end{cases} \quad \begin{cases} y=0 \\ \Delta = 4 - 4 = 0; x_{1,2} = \begin{cases} \frac{-2+0}{-2} = 1 \\ \frac{-2-0}{-2} = 1 \end{cases} \end{cases}$$

$A(1;0)$

INT. CON ASSE Y

$$\begin{cases} x=0 \\ y = -1 \end{cases} \quad B(0;-1)$$

ASSE DI SIMM.

$$\frac{-b}{2a} = \frac{-2}{-2} = 1$$

VERTICE

$$\begin{cases} x=1 \\ y = -1 + 2 - 1 \end{cases} \quad \begin{cases} x=1 \\ y = 0 \end{cases} \quad V(1;0)$$

3) Rappresenta la parabola  $y = -3x^2 + 5x - 2$  su un piano cartesiano monometrico in cui l'unità di misura corrisponde a sei quadretti, dopo averne determinato il vertice e le intersezioni con gli assi. Sullo stesso piano cartesiano rappresenta la retta di equazione  $3x + 2y = 2$

$$y = -3x^2 + 5x - 2$$

$$f(2) = -12 + 10 - 2 = -4$$

INT. CON ASSO X

$$\begin{cases} y=0 \\ y = -3x^2 + 5x - 2 \end{cases} \quad \begin{cases} y=0 \\ 0 = -3x^2 + 5x - 2 \end{cases} \quad \begin{cases} y=0 \\ \Delta = 25 - 24 = 1, x_{1,2} = \begin{cases} \frac{-5+1}{-6} = \frac{-4}{-6} = \frac{2}{3} \\ \frac{-5-1}{-6} = 1 \end{cases} \end{cases}$$

$$A\left(\frac{2}{3}, 0\right)$$

$$B(1, 0)$$

INT. CON ASSO Y

$$\begin{cases} x=0 \\ y = -2 \end{cases} \quad C(0, -2)$$

ASSO DI SIMM.

$$\frac{-b}{2a} = \frac{-5}{-6} = \frac{5}{6}$$

VERTICE

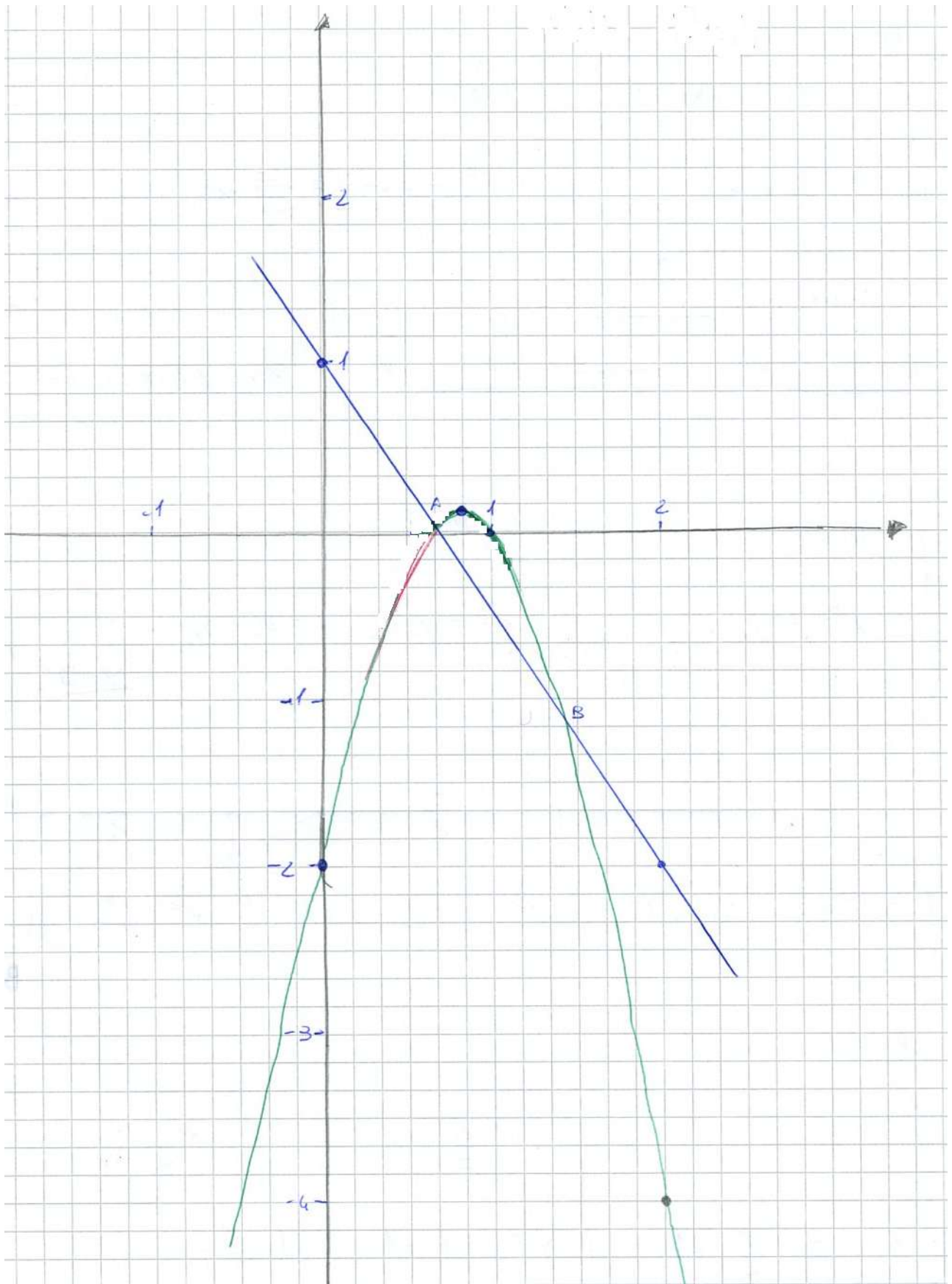
$$\begin{cases} x = 5/6 \\ y = -3 \cdot \left(\frac{25}{36}\right) + 5 \cdot \left(\frac{5}{6}\right) - 2 \end{cases} \quad \begin{cases} x = 5/6 \\ y = -\frac{25}{12} + \frac{25}{6} - 2 \end{cases}$$

$$\begin{cases} x = 5/6 \\ y = \frac{-25 + 50 - 24}{12} \end{cases} \quad \begin{cases} x = 5/6 \\ y = \frac{1}{12} \end{cases} \quad V\left(\frac{5}{6}, \frac{1}{12}\right)$$

$$3x + 2y = 2$$

$$\frac{2y}{2} = \frac{-3x+2}{2}; \quad y = -\frac{3}{2}x + 1$$

$$\begin{array}{c|c} x & y \\ \hline 0 & 1 \\ 2 & -2 \end{array}$$



Determina poi, in modo analitico, le intersezioni fra la parabola e la retta e verifica i tuoi risultati sul grafico

$$\begin{cases} y = -3x^2 + 5x - 2 \\ y = -\frac{3}{2}x + 1 \end{cases} \quad \begin{cases} \text{idem} \\ -3x^2 + 5x - 2 = -\frac{3}{2}x + 1 \end{cases}$$

$$\begin{cases} \text{idem} \\ \frac{-6x^2 + 10x - 4}{2} = \frac{-3x + 2}{2} \end{cases} \quad \begin{cases} \text{idem} \\ -6x^2 + 10x - 4 + 3x - 2 = 0 \end{cases}$$

$$\begin{cases} \text{idem} \\ -6x^2 + 13x - 6 = 0 \end{cases} \quad \begin{cases} \text{idem} \\ \Delta = 169 - 144 = 25; x_{1,2} = \begin{cases} \frac{-13+5}{-12} = \frac{-8}{-12} = \frac{2}{3} \\ \frac{-13-5}{-12} = \frac{-18}{-12} = \frac{3}{2} \end{cases} \end{cases}$$

$$\begin{cases} x = \frac{3}{2} \\ y = -\frac{3}{2} \cdot \left(\frac{3}{2}\right) + 1 \end{cases} \quad \begin{cases} x = \frac{2}{3} \\ y = -\frac{3}{2} + 1 \end{cases} \quad \begin{cases} x = \frac{2}{3} \\ y = \frac{-3+6}{2} \end{cases} \quad \begin{cases} x = \frac{3}{2} \\ y = -\frac{9}{4} \end{cases}$$

$B\left(\frac{3}{2}, -\frac{9}{4}\right)$

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

$A\left(\frac{2}{3}, 0\right)$