PARABOLA

EQ. GENERALE $\boxed{y = ax^2 + bx + c}$ $a, b, c \in \mathbb{R}$, $a \neq 0$

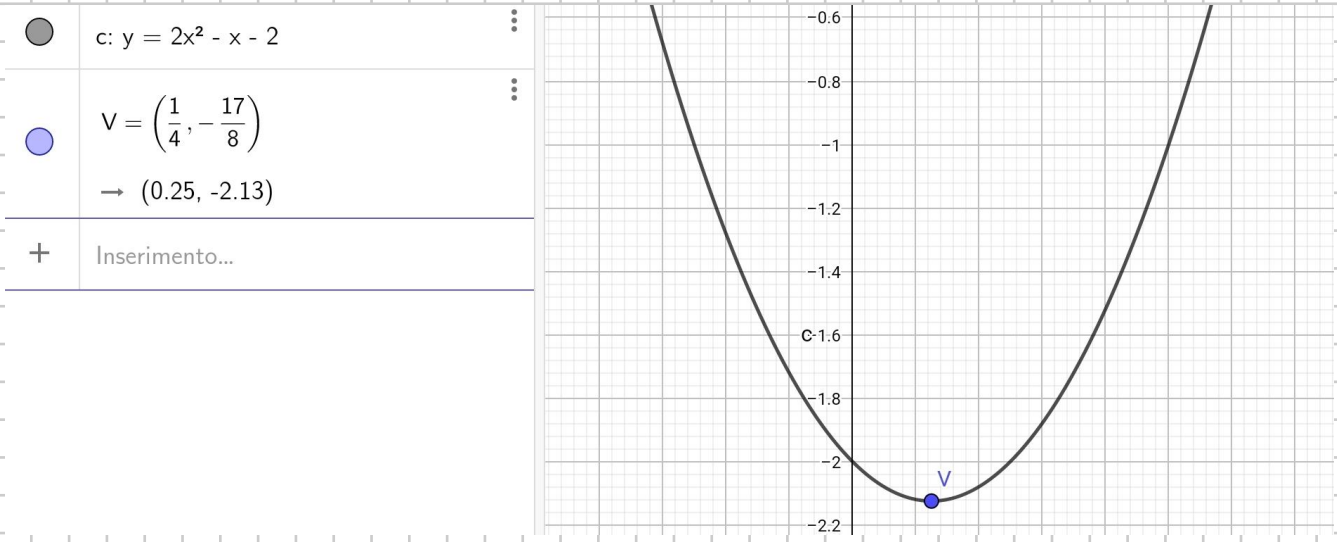
ES. $a = 2$, $b = -1$, $c = -2$ $\Rightarrow$ $y = 2x^2 - x - 2$

VERTICE DELLA PARABOLA $\boxed{V\left(-\frac{b}{2a}, -\frac{\Delta}{4a}\right)}$ $\Delta = b^2 - 4ac$

$y = 2x^2 - x - 2$

$x_V = -\frac{b}{2a} = -\frac{-1}{2 \cdot 2} = \frac{1}{4}$ $y_V = -\frac{b^2 - 4ac}{4a} = -\frac{1+16}{8} = -\frac{17}{8}$

$V\left(\frac{1}{4}, -\frac{17}{8}\right)$



ALTRI ESEMPI

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

$a = -1$

$b = 3$

$c = 5$

$\Delta = 9 + 20 = 29$

$V\left(\frac{3}{2}, +\frac{29}{4}\right)$

INT. CON ASSE y $\begin{cases} x = 0 \\ y = -x^2 + 3x + 5 \end{cases}$

$\begin{cases} x = 0 \\ y = 5 \end{cases}$ $A(0, 5)$

INT. CON ASSE x $\begin{cases} y = 0 \\ y = -x^2 + 3x + 5 \end{cases}$

$-x^2 + 3x + 5 = 0$

$x^2 - 3x - 5 = 0$

$x = \frac{3 \pm \sqrt{29}}{2}$

$B\left(\frac{3 - \sqrt{29}}{2}, 0\right)$ $C\left(\frac{3 + \sqrt{29}}{2}, 0\right)$

Se voglio altri punti:

ad es. $x = 1 \Rightarrow y = -1 + 3 + 5 = 7$ $D(1, 7)$

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

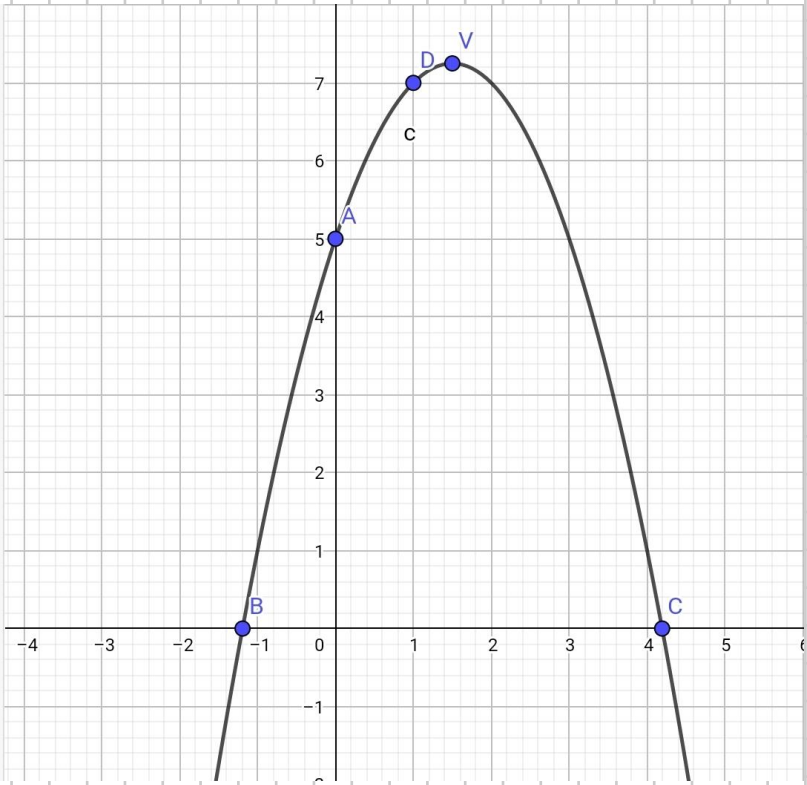
A = (0, 5)

$V = \left(\frac{3}{2}, \frac{29}{4}\right)$ → (1.5, 7.25)

$B = \left(\frac{3 - \sqrt{29}}{2}, 0\right)$ → (-1.19, 0)

$C = \left(\frac{3 + \sqrt{29}}{2}, 0\right)$ → (4.19, 0)

D = (1, 7)



$$\begin{cases} y = -x^2 + 3x + 5 \\ y = x + 2 \end{cases}$$

← INTERSEZIONE FRA RETTA E PARABOLA

$$\Downarrow$$

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

$$x^2 - 3x - 5 + x + 2 = 0$$

$$x^2 - 2x - 3 = 0 \qquad \frac{\Delta}{4} = 1 + 3 = 4$$

$$x = 1 \pm 2 = \begin{cases} -1 \\ 3 \end{cases}$$

$$\begin{cases} x = -1 \\ y = -1 + 2 = 1 \end{cases} \quad \vee \quad \begin{cases} x = 3 \\ y = 3 + 2 = 5 \end{cases}$$

$E(-1, 1)$ $\qquad$ $F(3, 5)$