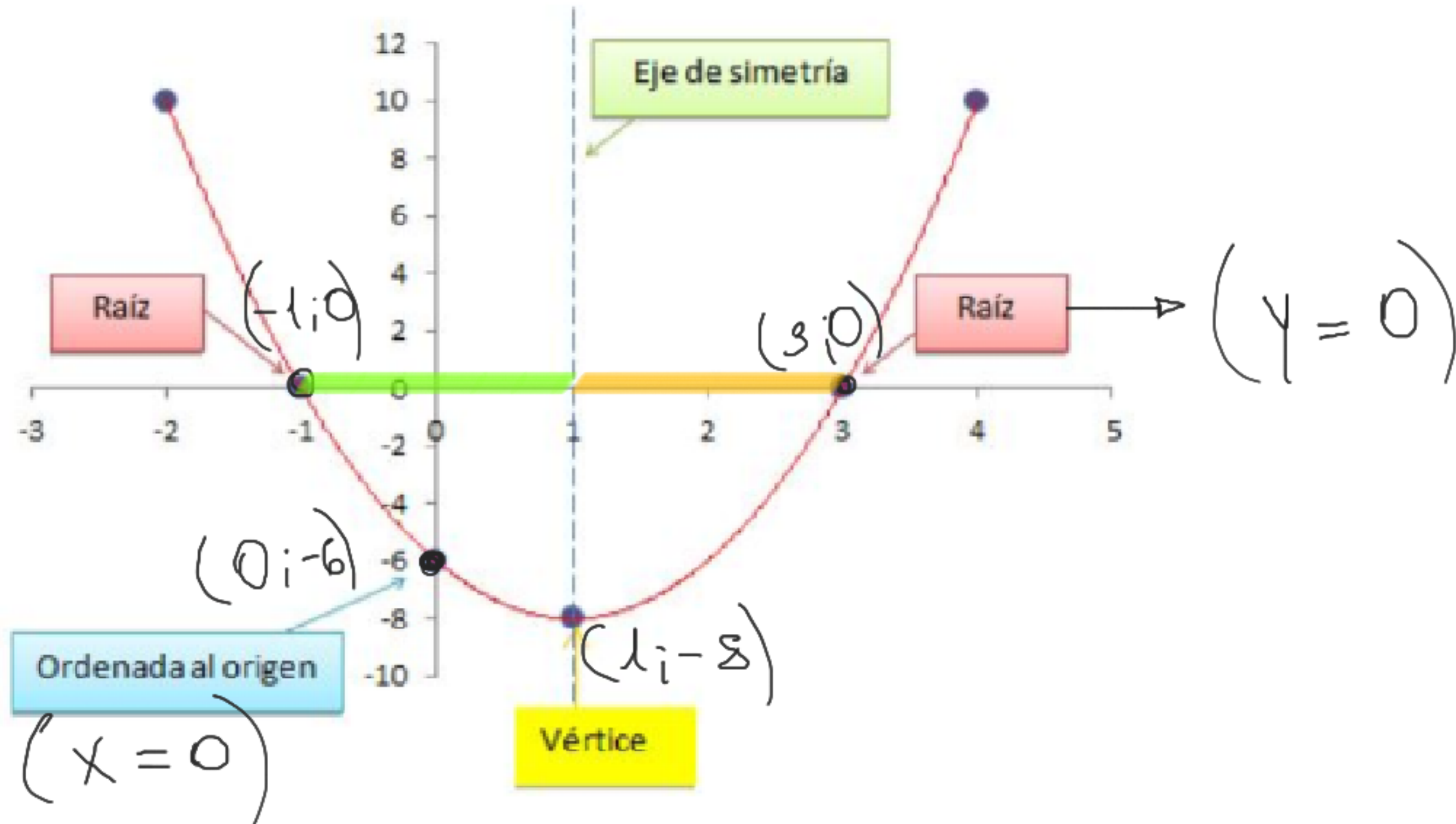


# FUNCIÓN CUADRÁTICA

$$y = ax^2 + bx + c$$

$$X_v = \frac{-b}{2a} \quad / \quad \frac{X_1 + X_2}{2}$$

Su gráfica es de la forma



Graficar la siguiente función hallando: Vértice, Raíces y Ordenada al origen  
Analizar C +, C- , Intervalos de crecimiento y decrecimiento, Dominio e Imagen

$$f(x) = 4x^2 + 4x - 8$$

Ordenada al origen : (x=0)

$$4 \cdot 0^2 + 4 \cdot 0 - 8 = -8$$

$$(0; -8)$$

Raíces:

$$0 = 4x^2 + 4x - 8$$

$$a = 4$$

$$b = 4$$

$$c = -8$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4 \times (4) \times (-8)}}{2 \times (4)} \Leftrightarrow$$

$$x = \frac{-4 \pm \sqrt{16 - (-128)}}{8} \Leftrightarrow$$

$$x = \frac{-4 \pm \sqrt{144}}{8} \Leftrightarrow$$

$$x = \frac{-4 + 12}{8} \vee x = \frac{-4 - 12}{8} \Leftrightarrow$$

$$x = \frac{8}{8} \vee x = -\frac{16}{8}$$

$$S = \{1, -2\}$$

Eje x

(-2; 0)

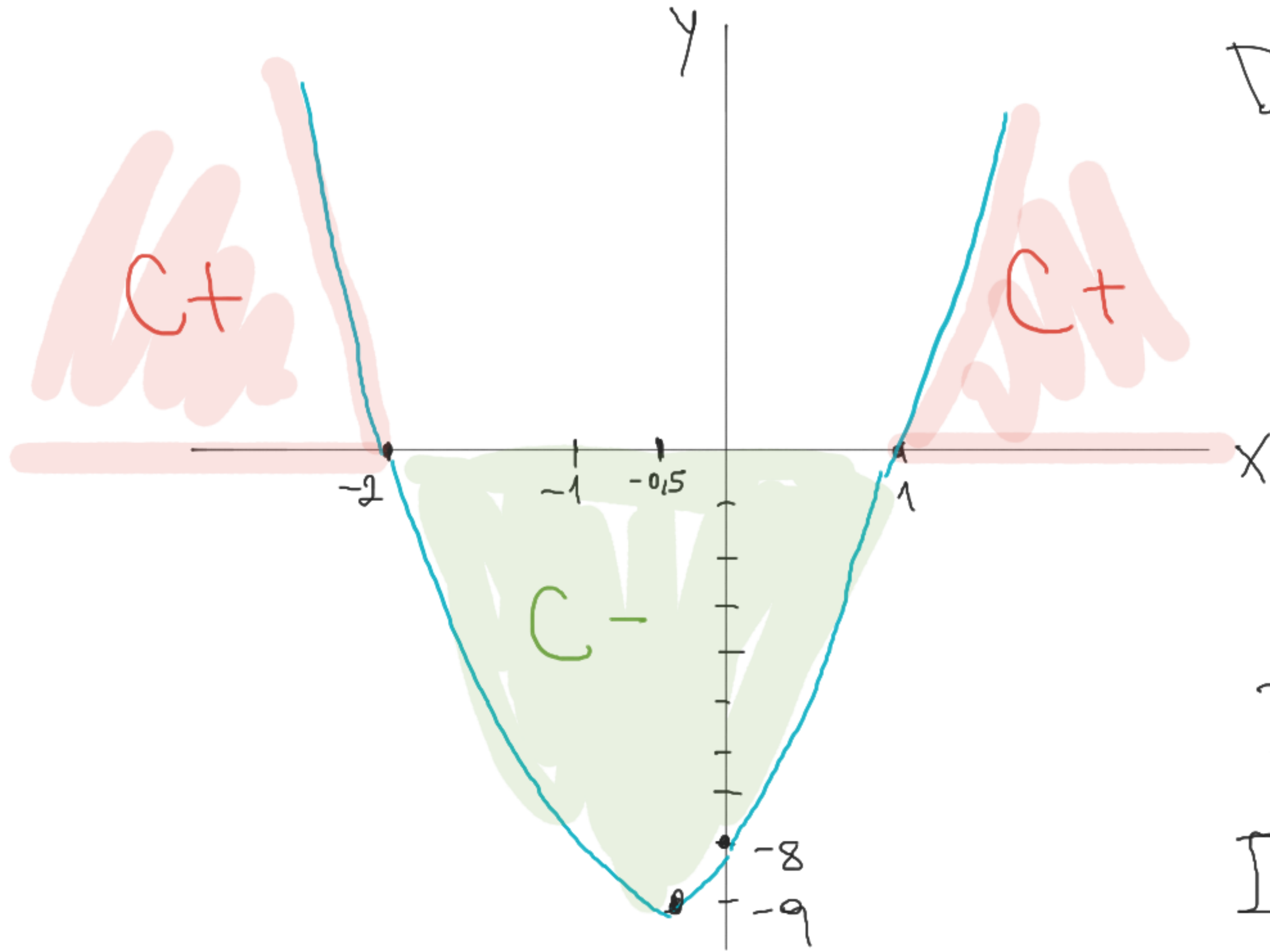
(1; 0)

$$X_v = \frac{x_1 + x_2}{2} = \frac{-2 + 1}{2} = -\frac{1}{2} = \boxed{-0,5}$$

$$Y_v = 4 \cdot (-0,5)^2 + 4 \cdot (-0,5) - 8 = \boxed{-9}$$

exemplo 20

$$\text{Vertex } (X_v; Y_v) = (-0,5; -9)$$



$$\text{Domínio} = (-\infty; \infty)$$

$$\text{Imagem} = [-9; \infty)$$

$$C^+ = (-\infty; -2) \cup (1; \infty)$$

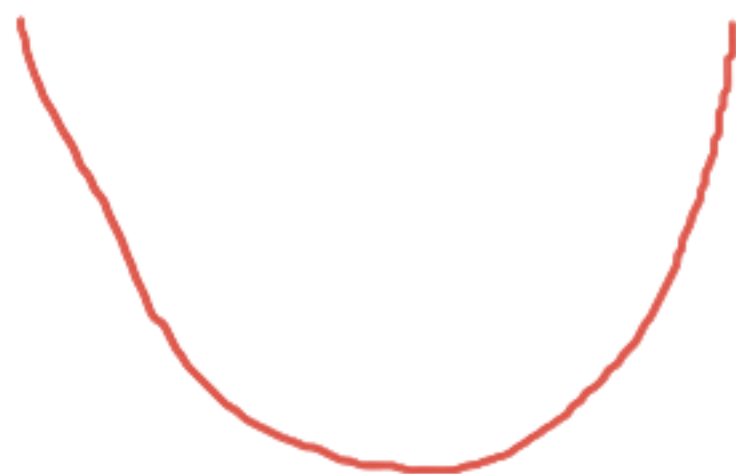
$$C^- = (-2; 1)$$

$$I^{\uparrow} = (-0.5; \infty)$$

$$I^{\downarrow} = (-\infty; -0.5)$$

$$y = ax^2 + bx + c$$

$$a > 0$$



$$a < 0$$



$$f(x) = x^2 - 4x + 5$$