1. Calcula el dominio de las siguientes funciones:

(a) $f(x) = \dfrac{x+13}{x^4+x^3-3x^2-3x}$

**Sol:** $\left(-\infty,-\sqrt{3}\right) \cup \left(-\sqrt{3},-1\right) \cup (-1,0) \cup \left(0,\sqrt{3}\right) \cup \left(\sqrt{3},\infty\right)$

(b) $f(x) = x^6+x^2-2$

**Sol:** $\mathbb{R}$

(c) $f(x) = \dfrac{7x+9}{x^3+8}$

**Sol:** $(-\infty,-2) \cup (-2,\infty)$

(d) $f(x) = \sqrt{\dfrac{x-1}{x}}$

**Sol:** $(-\infty,0) \cup [1,\infty)$

(e) $f(x) = \sqrt[3]{\dfrac{x-1}{x}}$

**Sol:** $(-\infty,0) \cup (0,\infty)$

(f) $f(x) = \sqrt[4]{\dfrac{x(x+7)}{x^2+5x+6}}$

**Sol:** $(-\infty,-7] \cup (-3,-2) \cup [0,\infty)$

(g) $f(x) = \dfrac{x^3-6x^2+4x+8}{x^3-x^2-9x+9}$

**Sol:** $(-\infty,-3) \cup (-3,1) \cup (1,3) \cup (3,\infty)$

(h) $f(x) = \dfrac{1}{4x^2-1}$

**Sol:** $\left(-\infty,-\dfrac{1}{2}\right) \cup \left(-\dfrac{1}{2},\dfrac{1}{2}\right) \cup \left(\dfrac{1}{2},\infty\right)$

(i) $f(x) = \dfrac{1}{\sqrt[4]{9-x^2}}$

**Sol:** $(-3,3)$

(j) $f(x) = \dfrac{2x+7}{\sqrt[3]{9-x}}$

**Sol:** $(-\infty,9) \cup (9,\infty)$

(k) $f(x) = \dfrac{x^2-5x+6}{\sqrt{x^4-1}}$

**Sol:** $(-\infty,-1) \cup (1,\infty)$

(l) $f(x) = \sqrt{-2x^2+5x-3}$

**Sol:** $\left[1,\dfrac{3}{2}\right]$

(m) $f(x) = \dfrac{x^2-3}{x^3-2x^2-x+2}$

**Sol:** $(-\infty,-1) \cup (-1,1) \cup (1,2) \cup (2,\infty)$

(n) $f(x) = \dfrac{5x^3-8}{1+x+x^2}$

**Sol:** $\mathbb{R}$

(ñ) $f(x) = \dfrac{x-1}{x^4-7x^2-144}$

**Sol:** $(-\infty,-4) \cup (-4,4) \cup (4,\infty)$

(o) $f(x) = \dfrac{7x+9}{81x^4-16}$

**Sol:** $\left(-\infty,-\dfrac{2}{3}\right) \cup \left(-\dfrac{2}{3},\dfrac{2}{3}\right) \cup \left(\dfrac{2}{3},\infty\right)$

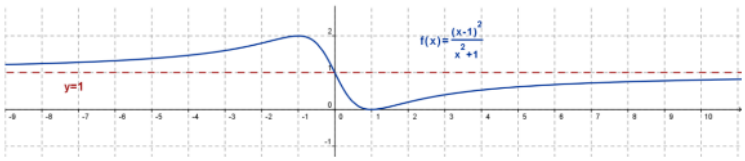
(p) $f(x) = \sqrt[3]{\dfrac{x^6-5x+1}{x^2-4x+4}}$

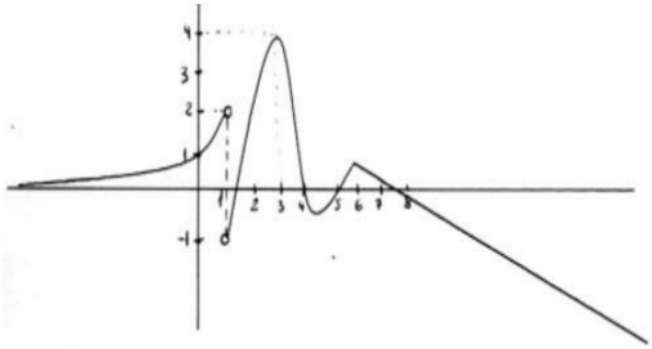
**Sol:** $(-\infty,2) \cup (2,\infty)$

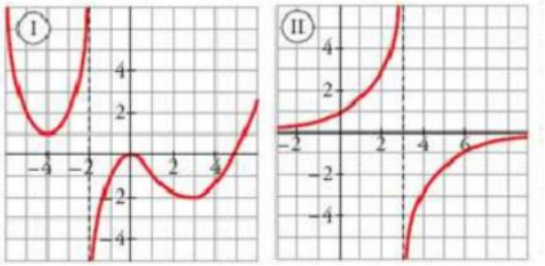
(q) $f(x) = \dfrac{\sqrt{x^2-4x-5}}{x^2+2x+1}$

**Sol:** $(-\infty,-1) \cup [5,\infty)$

2. Dadas las siguientes funciones, dadas por sus gráficas, obtén sus propiedades:

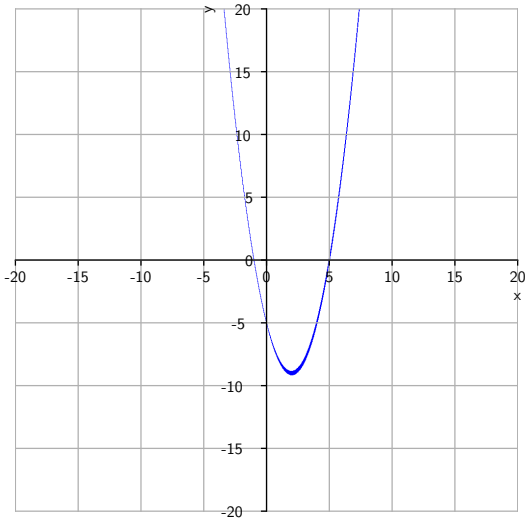




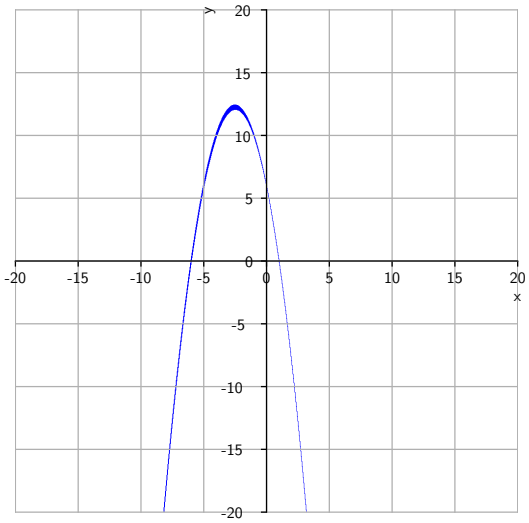

3. Representa las siguientes funciones e indica sus propiedades

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



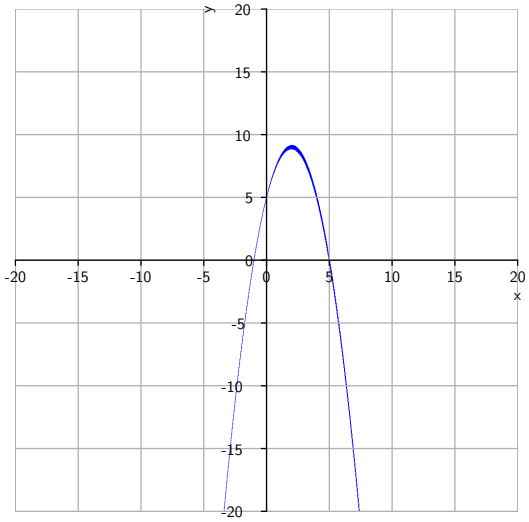
**Sol:**

(b) $f(x) = -x^2 - 5x + 6$




**Sol:**

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

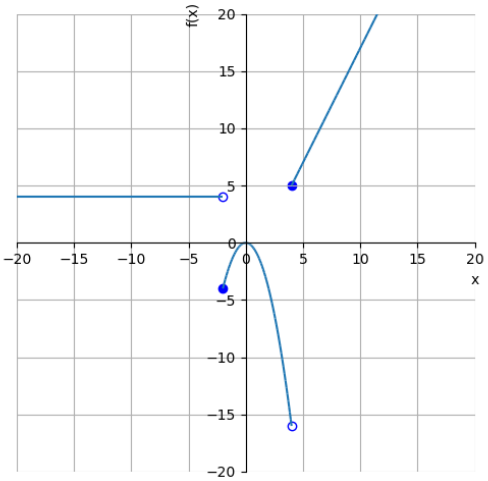



**Sol:**

4. Representa las siguientes funciones a trozos e indica sus propiedades:

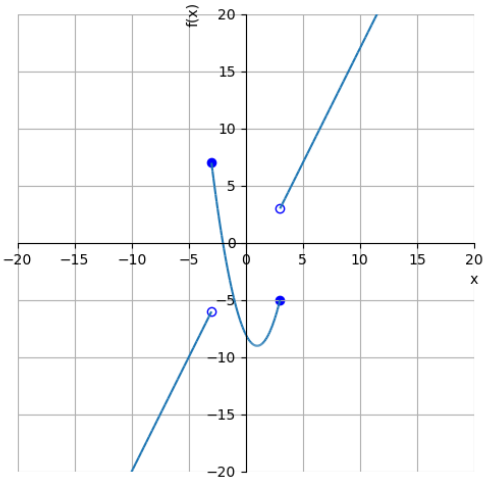
(a) $f(x) = \begin{cases} 4 & \text{si } x < -2 \\ -x^2 & \text{si } -2 \leq x < 4 \\ 2x - 3 & \text{si } x \geq 4 \end{cases}$

**Sol:**




(b) $f(x) = \begin{cases} 2x & \text{si } x < -3 \\ x^2 - 2x - 8 & \text{si } -3 \leq x \leq 3 \\ 2x - 3 & \text{si } x > 3 \end{cases}$

**Sol:**




(c) $f(x) = \begin{cases} x + 1 & \text{si } x \leq 0 \\ x^2 - 4x + 3 & \text{si } x > 0 \end{cases}$

**Sol:**