

1. Calcula el dominio de las siguientes funciones:

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

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

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

Sol: \mathbb{R}

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

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

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

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

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

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

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

Sol: $(-\infty, -3) \cup (-3, -2) \cup (-2, \infty)$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sol: \mathbb{R}

(ñ) $f(x) = \frac{x-1}{x^4-7x^2-144}$

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

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

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

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

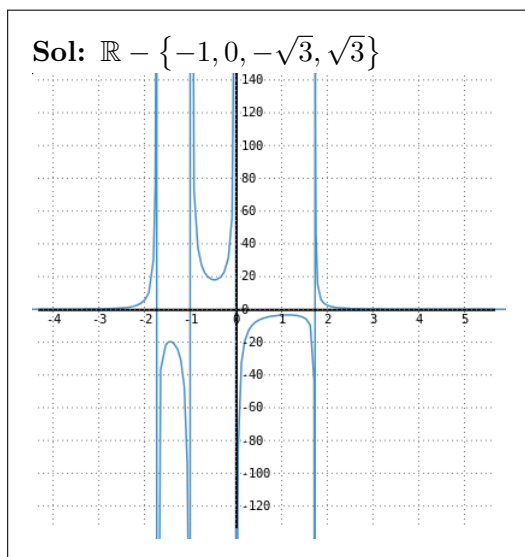
Sol: $(-\infty, 2) \cup (2, \infty)$

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

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

2. Calcular el dominio de las siguientes funciones:

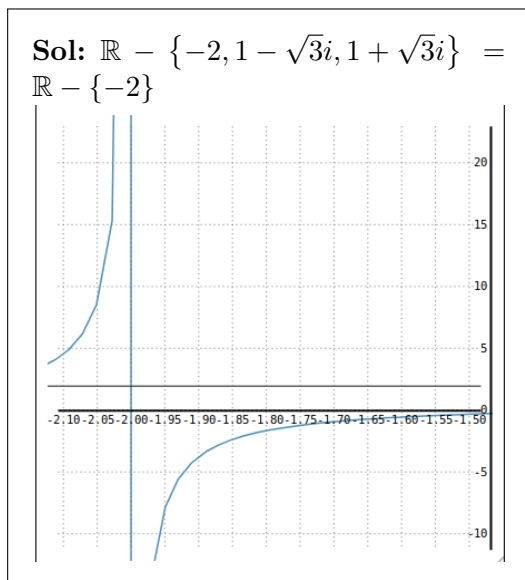
(a) $f(x) = \frac{x+13}{x^4+x^3-3x^2-3x}$



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

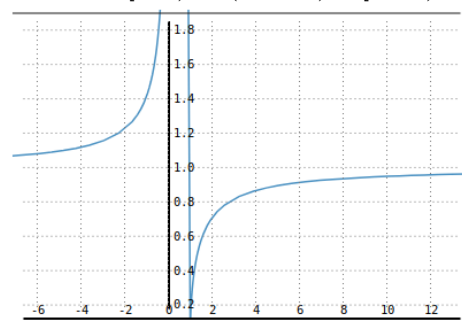
Sol: $\mathbb{R} - \emptyset$

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



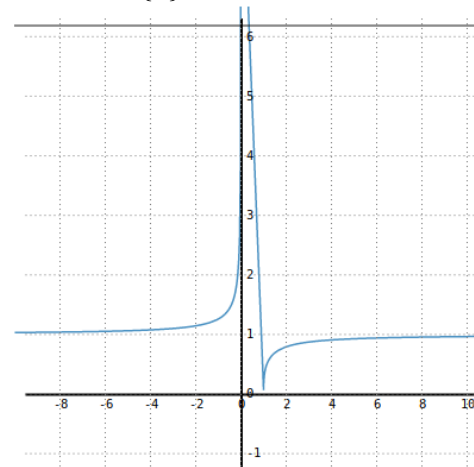
(d) $f(x) = \sqrt{\frac{x-1}{x}}$

Sol: $\mathbb{R} - [0, 1) = (-\infty, 0) \cup [1, \infty)$



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

Sol: $\mathbb{R} - \{0\}$

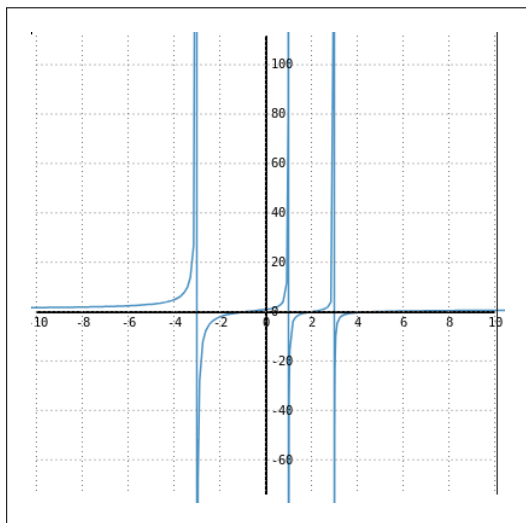


(f) $f(x) = \sqrt[4]{\frac{x(x+7)}{x^2+5x+6}}$

Sol:

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

Sol: $\{-3, 1, 3\}$



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

Sol:

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

Sol:

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

Sol:

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

Sol:

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

Sol:

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

Sol:

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

Sol:

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

Sol:

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

Sol:

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

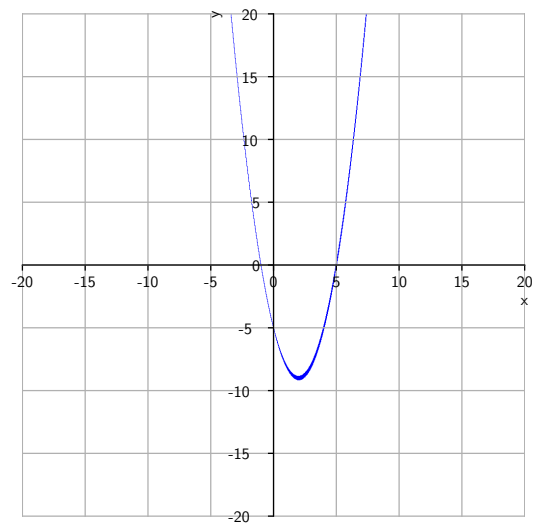
Sol:

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

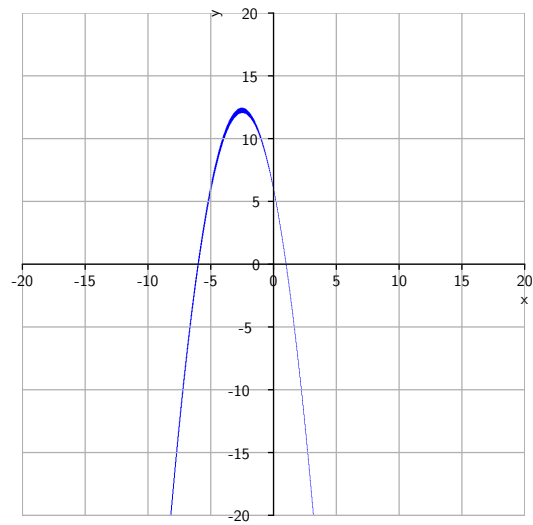
Sol:

3. Representa las siguientes funciones e indica sus propiedades

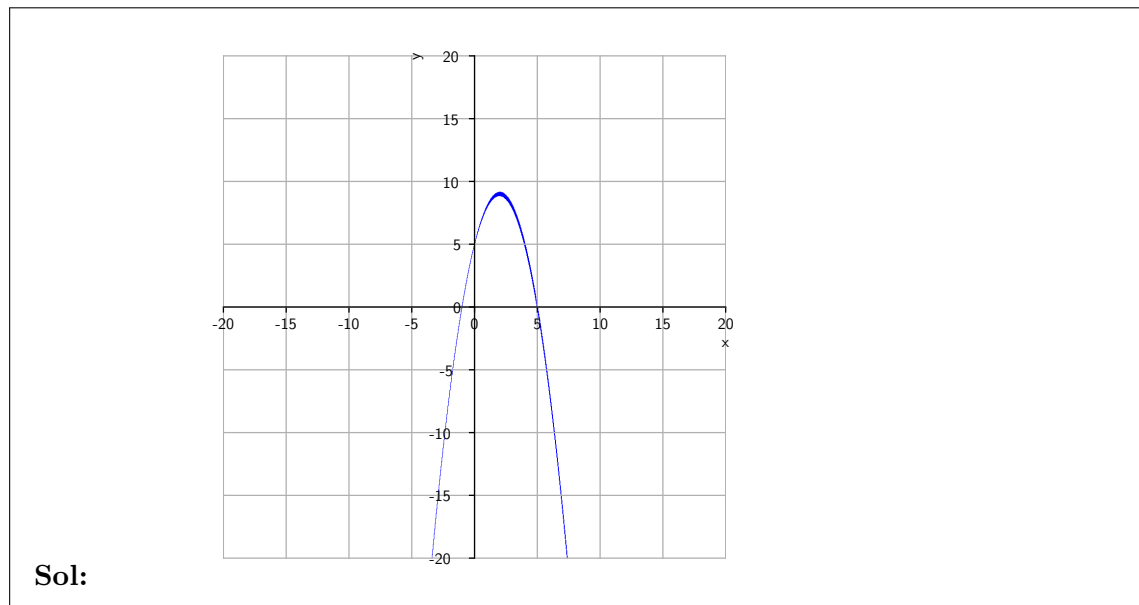
(a) $f(x) = x^2 - 4x - 5$

**Sol:**

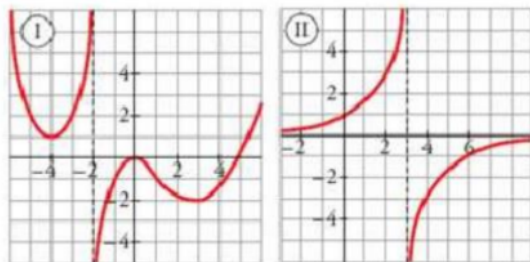
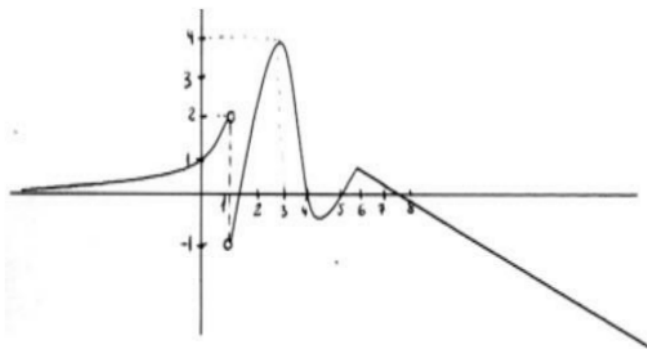
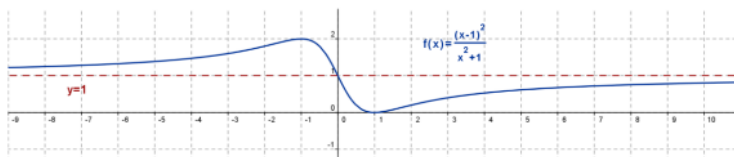
(b) $f(x) = -x^2 - 5x + 6$

**Sol:**

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

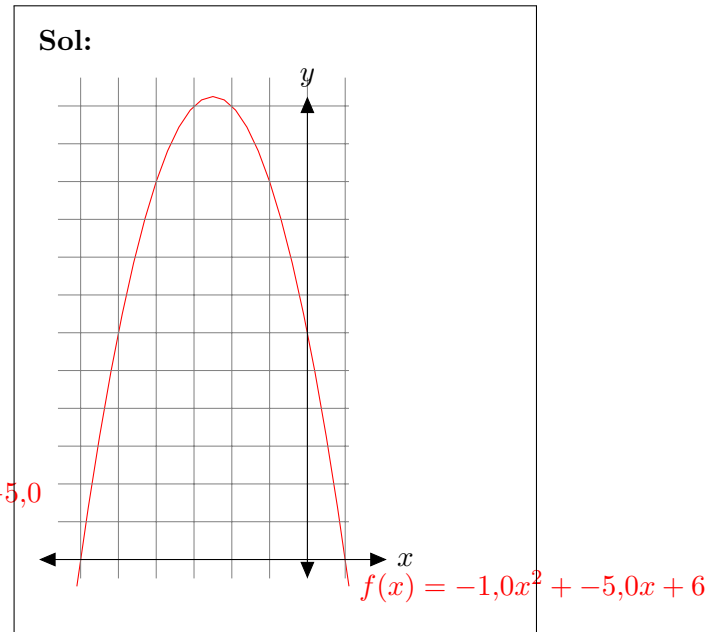
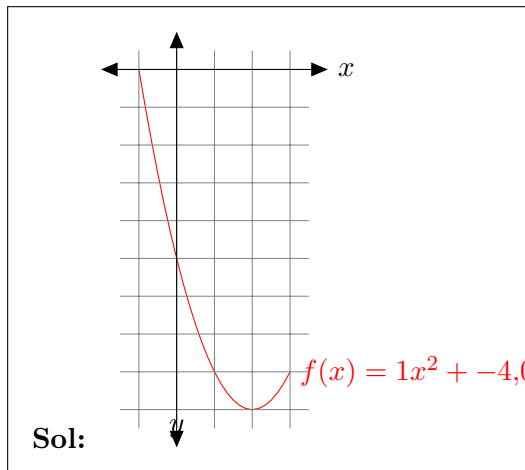


4. Dadas las siguientes funciones, dadas por sus gráficas, obtén sus propiedades:



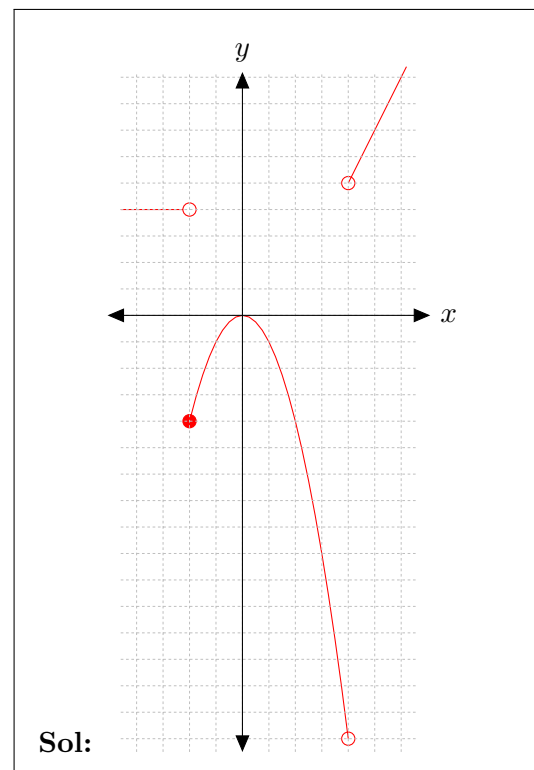
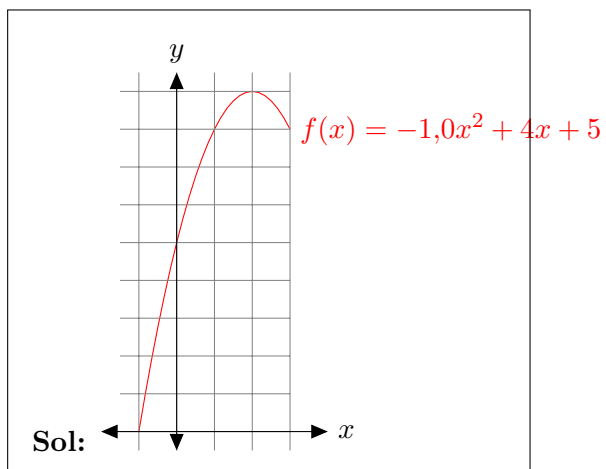
5. Representa las siguientes funciones, indicando sus propiedades:

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



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

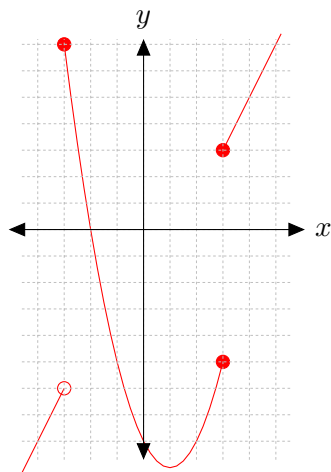
(b) $y = -x^2 + 4x + 5$



(c) $y = -x^2 - 5x + 6$

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

Sol: Nótese, que en este caso la definición no sería una función ($x = 3$ tiene dos imágenes)



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

