

✓ $\sqrt{x^2-14x+46}$ - $\sqrt{x^2-14x+46}$ - $\sqrt{x^2-14x+46}$

$$f(x) + g(x) = \sqrt{x^2-14x+46} + \sqrt{x^2-14x+46} \xrightarrow{\text{تقريب}} (f(x) + g(x))^2 = 12x + 2\sqrt{x^2-14x+46} \quad -1$$

$$\xrightarrow{\text{نقل}} (f(x) + g(x))^2 = 12x + 2\sqrt{x^2-14x+46} \Rightarrow f(x) + g(x) = 2\sqrt{x^2-14x+46} \Rightarrow a=0, b=2, c=-14$$

$$\frac{a+b}{c} = \frac{2}{-14}$$

$$g_f = \{(2, \frac{1}{2}), (0, 4)\} \quad -2$$

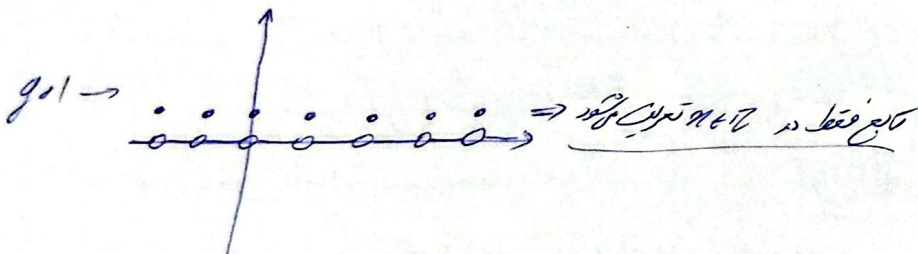
$$\text{Cdd)} f(x) = \{(0, 2), (1, 2), (2, 2), (-1, 2), (3, 2), (-2, 2)\}$$

$$\text{ب)} f(x^2) = \{(1, 2), (-1, 2), (2, 2), (-2, 2), (3, 2), (-3, 2)\}$$

$$\text{ج)} f(g(x)) = \{(2, 1), (1, 1), (0, 1), (-1, 1)\}$$

$$\text{د)} \frac{f}{g} = \{(1, -2), (2, -1)\}$$

$$h = 2f + g = \{(2, 4), (4, 4), (-2, 4)\} \quad -3$$



$$x - 2 \neq 0 \Rightarrow x \neq 2$$

$$x \geq 0 \Rightarrow x \geq 0$$

$$\sqrt{x^2-14x+46} - x \geq 0 \Rightarrow \sqrt{x^2-14x+46} \geq x \xrightarrow{x \geq 0} x^2-14x+46 \geq x^2 \Rightarrow 0 \leq x \leq 3$$

$$\xrightarrow{x \leq 0} 0 = 0$$

$$\frac{1}{x} = \{1, 0, 2\}$$

$$h_f = \frac{1}{-2} = -\frac{1}{2} \Rightarrow h(x) = \frac{f(x)}{g(x)} = \{(1, 0), (2, 1), (3, 0)\} \quad -4$$

$$a) y = x^r - (x-1)^r \rightarrow y-1 = (x-1)^r \Rightarrow x-1 = \sqrt[r]{y-1} \Rightarrow x = \sqrt[r]{y-1} + 1$$

$$\Rightarrow R_f \subseteq \mathbb{R}$$

$$\rightarrow) x^r - rx = 1 \xrightarrow{+y} (x^r - rx + 1)y = 1+y \Rightarrow (x-1)^r y = 1+y$$

$$\Rightarrow (x-1)^r = \frac{1+y}{y} \Rightarrow x-1 = \sqrt[r]{\frac{1+y}{y}} \Rightarrow x = \sqrt[r]{\frac{1+y}{y}} + 1$$

$$\Rightarrow y \neq 0, \frac{1+y}{y} \geq 0 \Rightarrow \frac{-1}{0} \frac{0}{0}$$

$$R_f \subseteq (-\infty, -1] \cup (0, \infty)$$

$$a) y = x^r - 4x + 10 \rightarrow y_{ext} = \frac{-b}{4a} = \frac{-(-4)}{4} = 1 \Rightarrow R_f \subseteq [4, \infty)$$

$$\rightarrow) y = -x^r + 4x + 1 \rightarrow x_{ext} = \frac{-b}{4a} = \frac{-4}{-2} = 2 \Rightarrow y_{ext} = -2^r + 8 + 1 \Rightarrow R_f \subseteq (-\infty, 12]$$

$$2) y = \sqrt{x^r + x - 1} \rightarrow y_{ext} = \frac{-b}{4a} = \frac{-(-1)}{4} = \frac{1}{4} \Rightarrow y_{ext} = \sqrt{\frac{1}{4} + \frac{1}{4} - 1} = \sqrt{-\frac{1}{2}} \Rightarrow R_f \subseteq [0, \infty)$$

$$1) y = \sqrt{-x^r + 4x} \rightarrow x_{ext} = \frac{-b}{4a} = \frac{-4}{-2} = 2 \Rightarrow y_{ext} = \sqrt{-2^r + 8} \Rightarrow R_f \subseteq [0, 9]$$

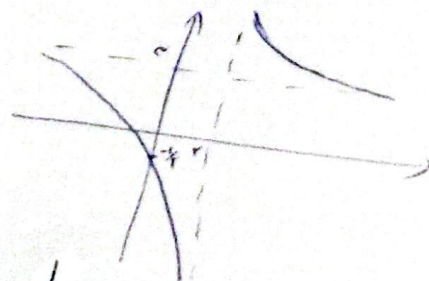
$$a) y = x^r - 2x^r + x + 1 \rightarrow x_{ext} = 1 \Rightarrow R_f \subseteq \mathbb{R}$$

$$\rightarrow) y = x^r - 4x^r + x + 1 \rightarrow x_{ext} = 1 \Rightarrow R_f \subseteq \mathbb{R}$$

$$2) \sqrt{x^r - 4x^r + x + 1} = y \Rightarrow R_f = \sqrt{\mathbb{R}} \subseteq [0, \infty)$$

$$1) y = (x^r - 4x^r + x + 1)^r \Rightarrow R_f \subseteq (\mathbb{R})^r \subseteq [0, \infty)$$

$$a) y = \frac{x+1}{x-1} \rightarrow R_f = \mathbb{R} - \{1\} \rightarrow$$



$$\rightarrow) y = \frac{x+1}{x-1} \rightarrow R_f = \mathbb{R} - \{1\} \rightarrow$$

