

$$f(x) = \sqrt{x-x^2-\epsilon^2} \rightarrow (x-1)(x-\epsilon) \leq 0 \rightarrow x \in [1, \epsilon]$$

$$h(x) = \frac{f(x)}{g(x)}$$

$$x=1 \rightarrow f(1)=0 \quad g(1)=1 \rightarrow h=0$$

$$x=\epsilon \rightarrow f(\epsilon)=\sqrt{\epsilon} \quad g(\epsilon)=\epsilon \rightarrow h=\frac{\sqrt{\epsilon}}{\epsilon}$$

$$x=\epsilon \rightarrow f(\epsilon)=0 \quad g(\epsilon)=\epsilon \rightarrow h=0$$

$$h = \{(1,0), (\epsilon, \frac{\sqrt{\epsilon}}{\epsilon}), (\epsilon, 0)\}$$

6

$$y = x^2 - 2x + 1 = (x-1)^2 \rightarrow \mathbb{R}$$

1, 2, 5

$$y = \frac{1}{x^2-2x} \rightarrow x^2-2x = (x-1)^2-1 \rightarrow t = (x-1)^2-1 \rightarrow [-1, 0) \cup (0, +\infty)$$

$$y = \frac{1}{t} \rightarrow (-\infty, -1] \cup (0, +\infty)$$

7

$$y = x^2 - 4x + 10 = (x-2)^2 + 6 \rightarrow \mathbb{R} : [6, +\infty)$$

$$y = -x^2 + 4x + 1 = -(x-2)^2 + 1 \rightarrow \mathbb{R} : (-\infty, 1]$$

$$y = \sqrt{x^2 - 4x + 5} = \sqrt{(x-2)^2 + 1} \rightarrow \mathbb{R} : [1, +\infty)$$

$$y = \sqrt{x-x^2} = \sqrt{1-(x-1)^2} \rightarrow [0, 1]$$

8

$$y = x^2 - 2x + 1 = (x-1)^2 \rightarrow \mathbb{R} : \mathbb{R}$$

$$y = x^2 - 2x + 1 = (x-1)^2 \rightarrow \mathbb{R} : \mathbb{R}$$

$$y = \sqrt{x^2 - 2x + 1} = |x-1| \rightarrow \mathbb{R} : [0, +\infty)$$

$$y = (x^2 - 2x + 1)^2 \rightarrow \mathbb{R} : [0, +\infty)$$

9

$$y = \frac{(x+1)}{x-1} \rightarrow a=1, c=1 \rightarrow \mathbb{R} : (\mathbb{R} - \{1\})$$

$$y = \frac{(x+1)}{x+1} \rightarrow a=1, c=1 \rightarrow \mathbb{R} : \mathbb{R} \setminus \{1\}$$

10

(الف) $y = n^3 - 2n^2 + 2n - 1 + 1 = y = (n-1)^3 + 1$ (v)

$$y-1 = (n-1)^3 \rightarrow \sqrt[3]{y-1} = n-1 \rightarrow n = \sqrt[3]{y-1} + 1$$

$R_f = \mathbb{R}$

(ب) $y = \frac{1}{n^2 - 2n} \rightarrow n^2 y - 2ny = 1 \rightarrow n^2 y - 2ny - 1 = 0$

$y \neq 0 \rightarrow n = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} \rightarrow 4y(y+1) \geq 0 \rightarrow \frac{-1}{+} \frac{0}{+}$

$y = 0 \rightarrow 0 = 1 \times$ صفتين وجدنا رد! $\rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$