

$$R(x) = \sqrt{(a-x)x^2+bx+b} \quad [1, +\infty)$$

$$(a-x=0 \rightarrow x=1) \quad R(x) = \sqrt{x^2+b}$$

$$x(1)+b=0$$

$$1+b=0 \rightarrow b=-1$$

1

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

$$D(f) = \mathbb{R}$$

$$(1)^2 - f(1-m^2) \leq 0$$

$$1-1+2m^2 \leq 0 \rightarrow 2m^2 \leq 0 \rightarrow m^2 \leq 0 \rightarrow m=0$$

$$1-(-1)=2$$

2

$$f(x) = \sqrt{4-x^2}$$

$$4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$$

$$D(f) = [-2, 2]$$

$$\text{مجموعه } \{-2, -1, 0, 1, 2\}$$

$$x \in (-1, 1) \rightarrow \text{مجموعه جواب}$$

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$$f(x) = \sqrt{x^2+2x^2} \Rightarrow x^2+2x^2 \geq 0 \rightarrow x^2(x+2) = 0$$

$$x=0 \quad x=-2$$

$$D(f) = [-2, +\infty)$$

$$x^2=1 \rightarrow x=\pm 1$$

$$f(x) = \sqrt{(x^2-1)(x^2-2x^2)}$$

$$x^2(x^2-2x^2) = 0$$

$$x=0 \quad x=2$$

$$D(f) = (-\infty, -1] \cup [0] \cup [2, +\infty)$$

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$$f(x) = \sqrt{|x-2|-2}$$

$$\begin{cases} x-2-2 \geq 0 \rightarrow x \geq 4 \\ -x+2-2 \geq 0 \rightarrow x \leq 0 \end{cases}$$

$$D(f) = (-\infty, 0] \cup [4, +\infty)$$

$$x > 2$$

$$x < 2$$

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الف) $y = \sqrt{1 - x/|x|} \Rightarrow 1 - x/|x| \geq 0 \rightarrow x/|x| \leq 1 \Rightarrow D(f) = (-\infty, 1]$

ب) $y = \frac{1}{\sqrt{3 - |x - \Delta|} - 1} \Rightarrow 3 - |x - \Delta| > 0 \rightarrow \begin{cases} 3 - x + \Delta > 0 \rightarrow x < \Delta + 3 \\ 3 + x - \Delta > 0 \rightarrow x > \Delta - 3 \end{cases}$
 $3 - |x - \Delta| \neq 1 \Rightarrow |x - \Delta| \neq 2 \Rightarrow \begin{cases} x - \Delta \neq 2 \rightarrow x \neq \Delta + 2 \\ x - \Delta \neq -2 \rightarrow x \neq \Delta - 2 \end{cases}$
 $D(f) = (\Delta - 3, \Delta - 2) \cup (\Delta - 2, \Delta) \cup (\Delta, \Delta + 2) \cup (\Delta + 2, \Delta + 3)$

الف) $y = \frac{\sin^2 x - 1}{\cos x \neq 0} \Rightarrow D(f) = \{x \in \mathbb{R} : x \neq \frac{\pi}{2} + k\pi, x \neq \frac{3\pi}{2} + k\pi\} = \mathbb{R} - \{x \in \mathbb{R} : x = \frac{\pi}{2} + k\pi, x = \frac{3\pi}{2} + k\pi, k \in \mathbb{Z}\}$

ب) $\frac{\cos x}{x \cos x - 1} \Rightarrow x \cos x - 1 \neq 0 \rightarrow x \cos x \neq 1 \rightarrow \cos x \neq \frac{1}{x}$
 $D = \{x \in \mathbb{R} : x \neq \frac{\pi}{2} + k\pi, k \in \mathbb{Z}\}$

الف) $y = \frac{x + 3}{|x + 1| - |x + 2|} \Rightarrow |x + 1| - |x + 2| \neq 0 \rightarrow (|x + 1|) \neq (|x + 2|)$
 $\star D(f) = \mathbb{R} - \{2, -\frac{5}{2}\}$

ب) $|x + 1| - |x + 2| > 0 \Rightarrow (|x + 1|) > (|x + 2|)$
 $x^2 + 2x + 1 > x^2 + 4x + 4 \Rightarrow x^2 + 2x + 1 > x^2 + 4x + 4 \Rightarrow -2x > 3 \Rightarrow x < -\frac{3}{2}$
 $x = \frac{5}{2} \quad x = -\frac{5}{2}$

$F(x) = \sqrt{\log_{\frac{1}{2}}(\frac{1}{x-1})}$
 $\log_{\frac{1}{2}}(x-1) > 0 \rightarrow x-1 > 1 \rightarrow x > 2$
 $\log_{\frac{1}{2}}(x-1) < 1 \rightarrow x-1 < 2 \rightarrow x < 3$
 $D(f) = (2, 3)$

الف) $\log(\sqrt{\cos x + 1}) \Rightarrow \log_{\frac{1}{2}}(\sqrt{\cos x + 1}) > 0 \rightarrow \sqrt{\cos x + 1} > 1 \rightarrow \cos x > 0 \rightarrow x \in (-\frac{\pi}{2}, \frac{\pi}{2})$
 $D(f) = \{x \in \mathbb{R} : x = \frac{\pi}{2} + k\pi, x = \frac{3\pi}{2} + k\pi, k \in \mathbb{Z}\}$
 ب) $\sqrt{\log(\frac{x-1}{x+1})} \Rightarrow \frac{x-1}{x+1} > 0 \rightarrow \frac{x-1}{x+1} > 0 \rightarrow (1+\infty) \cup (-1, 0)$
 $D(f) = (-\infty, -1)$