

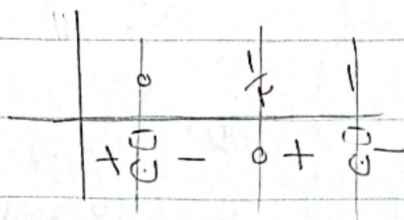
نویسن ار (ری) - آروم یازدهم سببها - تالیف سید

الف) $\phi(u) = \sqrt{\frac{u-1}{u} - \frac{u}{u-1}} \geq 0$

$$\frac{(u-1)(u-1)}{u(u-1)} - \frac{u(u)}{(u-1)(u)} = \frac{u^2 - 2u + 1 - u^2}{u(u-1)} = \frac{-2u+1}{u(u-1)}$$

$$\frac{-2u+1}{u(u-1)} \geq 0 \quad -2u+1 \geq 0 \quad 2u \leq 1 \quad u \leq \frac{1}{2}$$

$$u(u-1) \neq 0$$



$$(-\infty, 0) \cup [\frac{1}{2}, 1)$$

ب) $\phi(u) = \frac{\frac{1}{u+1} - \frac{u}{u}}{\frac{u}{u-1} + \frac{1}{u+1}} = \frac{\frac{u - u^2 - u}{u^2 + u}}{\frac{u^2 + u + u - 1}{u^2 + u - 1}}$

$$\frac{(-u - u^2)(u^2 + u - 1)}{(u^2 + u)(u^2 + u - 1)}$$

مجموعه حلال = $0, -\frac{1}{u}, -1$ $D_\phi = \mathbb{R} - \{0, -1, -\frac{1}{u}\}$

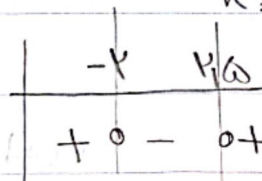
الف) $\phi(u) = \sqrt{\left(\left(\frac{1}{u}\right)^u - 9\right)(3u - 4u)} \geq 0$

$$\frac{1}{u} - 9 = 0$$

$$u = -\frac{1}{9}$$

$$3u - 4u = 0$$

$$u = 0$$



$$(-\infty, -\frac{1}{9}] \cup [0, +\infty)$$

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ب) $\phi(x) = (\sqrt{x-1} + \sqrt{y+1} = 3)^2$

$$\sqrt{x-1} + y+1 = 9$$

$$y = 9-1-\sqrt{x-1}$$

$$y = 8-\sqrt{x-1} \quad \sqrt{x-1} \geq 0 \quad x \geq 1$$

$$D\phi = [1, +\infty)$$

۳) $\phi(x) = \frac{\log(x^2 - x - 1)}{\sqrt{x^2 - 1} + 1}$

$$\begin{aligned} x^2 - x - 1 &> 0 \\ (x-1)(x+1) &> 0 \end{aligned}$$

۳

	-1	1
+	-	+

$$\sqrt{x^2 - 1} \geq 0$$

$$\mathbb{R} - \{0\} \quad I$$

$$II \quad (-\infty, -1) \cup (1, +\infty)$$

۴) $\phi(x) = \sqrt{1 + ax - x^2} \geq 0 \quad [-a, b]$

$$1 - 2a - 1 = 0$$

$$-2a = 1 \quad a = -\frac{1}{2}$$

$$1 - \frac{1}{2}x - x^2 \geq 0$$

$$2x^2 + x - 4 \geq 0$$

$$x^2 + x - 1 \geq 0$$

$$(x+1)(x-1) \geq 0$$

$$(x+1)(x-1) \geq 0$$

$$-1 \leq x \leq 1$$

	-1	1
-	+	-

$$b = \frac{1}{2}$$

$$a+b = -1 + \frac{1}{2} = -\frac{1}{2}$$

$$a) \quad f(x) = \begin{cases} 3x-2 : x \geq 1 \\ 2x+2 : x < 1 \end{cases} \quad -2 \rightarrow \text{منفی}$$

سوال: $g(x) = \sqrt{f(x)-x} \geq 0$

$$f(x) \geq x$$

مثلاً: $x = -3, -2, -1, 0, \dots$

$$x = -1$$

$$-1+2 = 1$$

$$D_f = (-3, +\infty)$$

$$c) \quad f(x) = \begin{cases} (a+1)x+2 : x \geq 1 \\ 3a+2x : x < 1 \end{cases}$$

$$f(a) = f(-1) + a$$

$$f(a) = 1, 100$$

$$f(a) = (a+1)(1) = 1a+1$$

$$1a+1 = 3a-1+a$$

$$f(-1) = 3a-1$$

$$10a = -1$$

$$a = -1/10$$

$$v) \quad f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + 2$$

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

$$f(2-\sqrt{2}) + f(2+\sqrt{2}) = ?$$

$$\sqrt{2-\sqrt{2}} + \frac{1}{\sqrt{2-\sqrt{2}}} + 2 + \sqrt{2+\sqrt{2}} + \frac{1}{\sqrt{2+\sqrt{2}}} + 2 = 2 + 2\sqrt{4}$$

مجموع

$$\sqrt{\frac{1}{2-\sqrt{2}} + \frac{1}{2+\sqrt{2}}} + 2 = \sqrt{4}$$

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$$1) \quad 4f(u) - 3f(-u) = 4u^2 - u \times 1^2$$

$$4f(-u) - 3f(u) = 4u^2 + u \times 1^2 \quad (-u) \text{ نوسه}$$

$$4f(u) - 3f(-u) = 4u^2 - u$$

$$4f(-u) - 3f(u) = 4u^2 + u$$

$$-5f(u) = 4u^2 + u$$

$$f(u) = -\frac{4}{5}u^2 - \frac{u}{5}$$

$$9) \quad (u+1)f(u) - 4uf(u+1) = 4u^2 - mu + 1^2m - 1$$

$$u = -1$$

$$0 = 4 + 1^2m + 1^2m - 1$$

$$0 = 4 + 2m$$

$$m = -2$$

$$4f(0) = -4 - 1$$

$$f(0) = -1$$

$$10) \quad f(u) + f\left(\frac{1}{u}\right) = \frac{4u^2 - 4u + 1}{u}$$

$$f(-1) = ?$$

$$y = 4u - 4$$

$$f(-1) = y = -4 - 4 = -8$$

$$f(u) = au + b$$

$$f\left(\frac{1}{u}\right) = \frac{a}{u} + b$$

$$f(u) + f\left(\frac{1}{u}\right) = au + \frac{a}{u} + b$$

$$\frac{4u^2 - 4u + 1}{u} = 4u - 4 + \frac{1}{u}$$

$$a = 4$$

$$b = -4$$

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