

$$f(x) = \sqrt{1-x^2} \quad g = \{(-1, 1)(0, \kappa)(1, 0)(1, \nu)\}$$

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$$\nu g - \mu f = \{(-1, \nu - \mu \times \sqrt{1-(-1)^2})(0, \kappa - \mu \times \sqrt{1-0})(1, 0 - \mu \times \sqrt{1-1})(1, \varepsilon - \mu \times \sqrt{1-1})\}$$

$$\nu g - \mu f = \{(-1, \nu)(0, \omega)(1, \kappa)\} \quad \kappa + \nu + \omega = 11$$

$$f(x) = 2x - 1 \quad D_f = [\mu, +\infty) \quad \xrightarrow{x=\mu} y = 4 - 1 = \omega \quad R_f = [\omega, +\infty)$$

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$$g(x) = \frac{1}{\mu}x + \nu \quad D_g = (-\infty, \kappa] \quad \xrightarrow{x=\mu} y = \frac{1}{\mu} \times \mu + \nu = \varepsilon \quad R_g = (-\infty, \kappa]$$

$$R_f \cup R_g = (-\infty, \kappa] \cup [\omega, +\infty)$$

$$y = \frac{-x^2}{\nu} + x + \mu \geq \frac{\mu}{\nu} \quad \xrightarrow{x^2} -x^2 + 2x + 4 \geq \mu \Rightarrow x^2 - 2x - \mu < 0$$

$$(x-\mu)(x+1) < 0 \quad \begin{array}{c} -1 \quad \mu \\ + \quad | \quad - \quad | \quad + \end{array}$$

$$\sqrt{b-a} = \sqrt{\mu - (-1)} = \sqrt{\varepsilon} = \nu$$

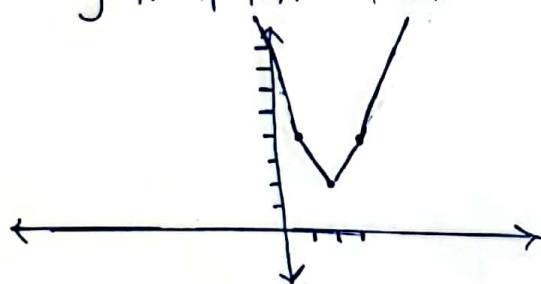
$$(a, b) = (-1, \mu)$$

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$$y = |x-1| + |x-\mu| + |2x-\varepsilon|$$

$$\begin{array}{cccc} & 1 & \mu & \nu \\ -x+1-x+\mu & x-1-x+\mu & x-1-x+\mu & x-1+x-\mu+2x-\varepsilon \\ -2x+\varepsilon & -2x+\varepsilon & +2x-\varepsilon & = \varepsilon x - 1 \\ = -\varepsilon x + 1 & = -2x + \mu & = 2x - \nu & \end{array}$$

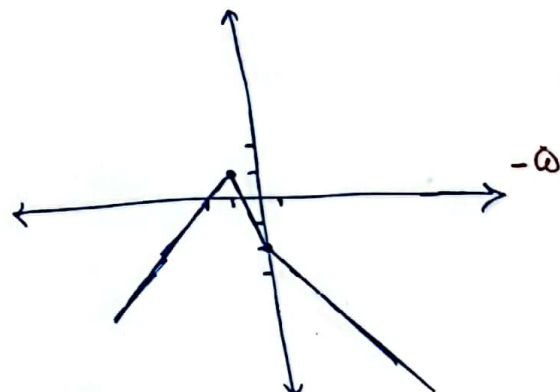
$$\text{میان دو نقطه: } y = \nu$$



$$y = |x| - 2|x+1|$$

$$\begin{array}{ccc} -1 & 0 & \\ -x+2x+2 & -x-2x-2 & x-2x-2 \\ = x+2 & = -3x-2 & = -x-2 \end{array}$$

$$R_f = (-\infty, 1]$$



$$y = \frac{x^2 + \omega x + m}{x+1} \Rightarrow yx + y = x^2 + \omega x + m \Rightarrow x^2 + (\omega - y)x + m - y = 0$$

$$x = \frac{y - \omega \pm \sqrt{(\omega - y)^2 - 4(m - y)}}{2} \quad (\omega - y)^2 - 4(m - y) \geq 0$$

$$\begin{cases} \Delta \geq 0 \rightarrow 17. \\ \Delta < 0 \rightarrow 34 - 4(\omega - \varepsilon m) < 0. \end{cases}$$

$$y^2 - 1. y + 2\omega - \varepsilon m + 4y \geq 0$$

$$34 - 100 + 14m < 0 \Rightarrow 14m < 66$$

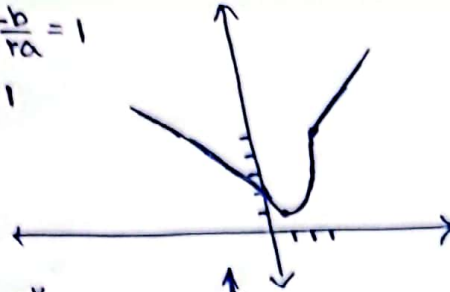
$$\Rightarrow m < \varepsilon \xrightarrow{m \in \mathbb{N}} m = 1, 2, 3$$

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$$\begin{cases} x+r & x \geq 0 \\ x^2-rx+r & 0 \leq x < r \\ |x|+r & x < 0 \end{cases} \rightarrow \min \left| \frac{-b}{2a} \right| = 1$$

$$R_f = [1, +\infty)$$

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$$\begin{cases} x^2 + \varepsilon x + r & x \leq 0 \\ [rx] - rx & x > 0 \end{cases} \rightarrow \min \left| \frac{-\varepsilon}{2} \right| = -r$$

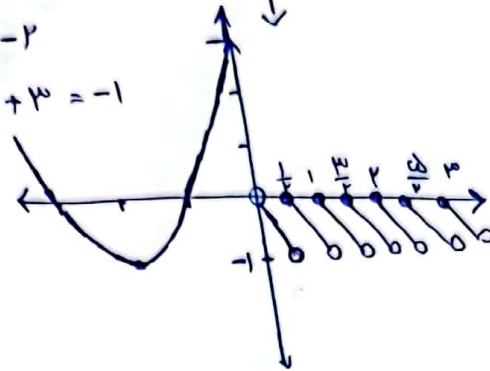
$$\varepsilon - 1 + r = -1$$

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

$$x = -r \quad x = -1$$

$$R_f = [-1, +\infty)$$

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$$y = a+1 - \sqrt{rx+r} \quad D_f = [b, +\infty) \quad R_f = (-\infty, a]$$

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$$rx+r \geq 0 \Rightarrow rx \geq -r \Rightarrow x \geq -\frac{r}{r} \Rightarrow D_f = \left[-\frac{r}{r}, +\infty\right) \Rightarrow b = -\frac{r}{r}$$

$$x = -\frac{r}{r} \rightarrow a = a+1 - \sqrt{rx\left(-\frac{r}{r}\right)+r} \Rightarrow a = \varepsilon \quad \therefore ab = -\frac{r}{r} \times \varepsilon = -\varepsilon$$

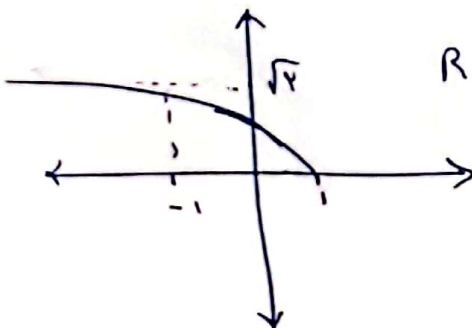
$$f(x) + g(x) = r \sqrt{r + r \sqrt{1-x^2}} \xrightarrow{\text{POSS}} 9 \times \underbrace{(r + r \sqrt{1-x^2})}_{(\sqrt{1-x} + \sqrt{1+x})^2} \xrightarrow{\text{NO}}$$

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$$f(x) + g(x) = r(\sqrt{1-x} + \sqrt{1+x})$$

$$r\sqrt{x+1} + \varepsilon\sqrt{1-x} + g(x) = r\sqrt{1-x} + r\sqrt{1+x} \Rightarrow g(x) = \sqrt{x+1} - \sqrt{1-x}$$

$$\frac{f(x) - rg(x)}{4} = \frac{r\sqrt{x+1} + \varepsilon\sqrt{1-x} - r\sqrt{x+1} + r\sqrt{1-x}}{4} = \sqrt{1-x}$$



$$R_f = [0, \sqrt{r}]$$