

مبتدایان
گروه دهم

$$1- \text{ اگر } f(x) = \sqrt{1-x^2} \text{ و } f(x) = (x, 0) \text{ و } (0, 1) \text{ و } (-1, 0) \text{ و } (1, 0) \text{ و } g = \text{مجموع اعضای برد تابع}$$

$$2g - 2f$$

$$2g - 3f$$

$$4 \quad f(x) = \sqrt{1-x^2} \rightarrow D_f = \{x \mid -1 \leq x \leq 1\} \rightarrow x^2 \leq 1 \rightarrow -1 \leq x \leq 1$$

$$5 \quad g(x), D_g = \{(-1, 0), (0, 1), (1, 0)\}$$

$$7 \quad D_f \cap D_g = \{(-1, 0), (0, 1), (1, 0)\} \rightarrow$$

$$8 \quad 2g = \{(-1, 0), (0, 1), (1, 0)\}, 3f = \{(-1, 0), (0, 1), (1, 0)\}$$

$$9 \quad 2g - 3f = \{(-1, 0), (0, 1), (1, 0)\} \rightarrow \{2, 5, 4\}$$

$$2- \text{ اگر دامنه تابع } f(x) = 2x - 1 \text{ بازه } [3, +\infty) \text{ و دامنه تابع } g(x) = \frac{1}{x} + 3 \text{ بازه } (-\infty, 4]$$

$$\text{بازه } (-\infty, 4] \text{ باشد اضعای برد تابع } f \text{ و } g$$

$$15 \quad f(x) = 2x - 1 \rightarrow [3, +\infty) \rightarrow 2x \geq 4 \rightarrow x \geq 2 \rightarrow 2x - 1 \geq 3$$

$$16 \quad R_f = [3, +\infty)$$

$$17 \quad g(x) = \frac{1}{x} + 3 \rightarrow x \leq 4 \rightarrow \frac{1}{x} \leq 1 \rightarrow \frac{1}{x} + 3 \leq 4$$

$$18 \quad R_g = (-\infty, 4]$$

$$20 \quad R_f \cup R_g = (-\infty, 4] \cup [3, +\infty)$$



۳- بر نمودار سهمی $f(u) = -\frac{u^2}{2} + u + 3$ در بازه (a, b) از اعداد $\frac{3}{2}$

بزرگتر است. بیشترین مقدار $\sqrt{b-a}$

$$f(x) = -\frac{x^2}{2} + x + 3 \quad \text{و} \quad x_s = \frac{-b}{-2a} = 1 \quad \text{و} \quad -\frac{1}{2} + 1 + 3 = \frac{5}{2}$$

$$-\frac{x^2}{2} + x + 3 = \frac{3}{2} \rightarrow -\frac{x^2}{2} + x + \frac{3}{2} = 0 \quad \rightarrow \quad x = 1 \quad \text{و} \quad x = 3$$

$$(a, b) \rightarrow (-1, 3) \rightarrow \sqrt{3+1} = \sqrt{4} = 2$$

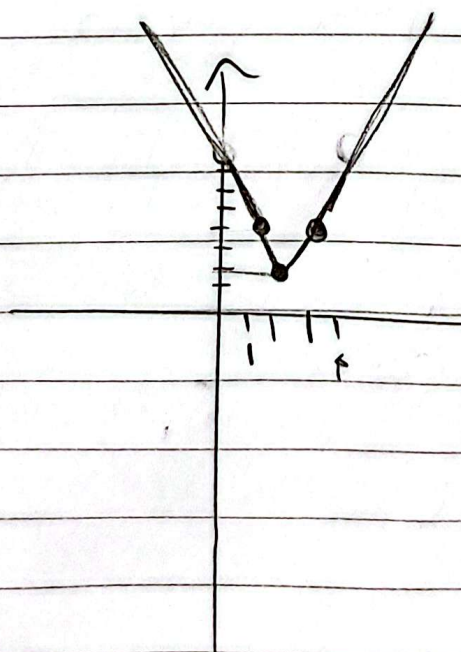
$$y = \left| \frac{u-1}{1} \right| + \left| \frac{u-3}{3} \right| + \left| \frac{2u-3}{2} \right| \quad \text{کمترین مقدار}$$

$$x+1-x+3 \rightarrow 4 \quad x < 1 \quad \rightarrow \quad 4x+1 \quad \begin{array}{c|c} 1 & 0 \\ \hline 4 & 1 \end{array}$$

$$x-1-x+3-2x+3 \rightarrow -2x+4 \quad 1 < x < 2 \quad \rightarrow \quad -2x+4 \quad \begin{array}{c|c} 1 & 4 \\ \hline -2 & 2 \end{array}$$

$$x-1-x+3+2x-3 \rightarrow x-1 \quad 2 < x < 3 \quad \rightarrow \quad x-1 \quad \begin{array}{c|c} 1 & 2 \\ \hline 1 & 3 \end{array}$$

$$x-1+x-3+2x-3 \rightarrow 3x-7 \quad x > 3 \quad \rightarrow \quad 3x-7 \quad \begin{array}{c|c} 3 & 2 \\ \hline 3 & 2 \end{array}$$



min y = 2

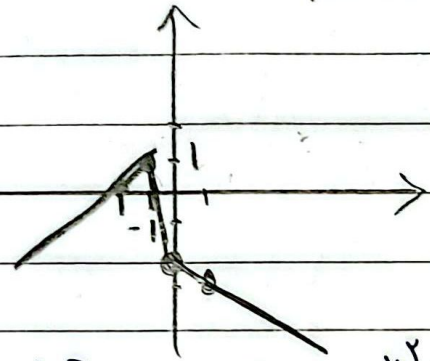
برای $y = |x| - 2$ $|x+1|$ $\frac{-1}{-1} = 1$

$x - 2(x-1) \rightarrow x - 2x + 2 \rightarrow -x + 2 \rightarrow x + 2$

$2x - 2 \rightarrow 1 < x < 5 \rightarrow -3x - 2 \rightarrow \frac{-1}{1} = -2$

$x - 2x - 2 \rightarrow x > 0 \rightarrow x - 2$

$\frac{0}{-2} \mid \frac{1}{-2}$



$R_+ \cup (-\infty, 1]$

برای $y = \frac{x^2 + ax + m}{x+1}$ R $y = \frac{x^2 + ax + m}{x+1}$

$yx + y = x^2 + ax + m \rightarrow x^2 + x(a-y) + m-y$

$\Delta \geq 0 \rightarrow b^2 - 4ac \rightarrow (a-y)^2 - (4)(1)(m-y)$

$4a + y^2 - 4ay - 4m + 4y = y^2 - 4y + 4a - 4m + 4y$

$4a - 4m \rightarrow 4a - 4m < 0 \rightarrow 4a < 4m \rightarrow m > a$

$\Delta < 0 \rightarrow \{1, 2, 3\} \rightarrow R = [1, 3] \times \mathbb{R}$

$\frac{x^2 + ax + m}{x+1} \rightarrow \frac{x^2 + ax + m}{x+1} = (x+1)(x+k) + m-k$

$kx + m \rightarrow kx + k + \frac{m-k}{x+1}$

$m-k \rightarrow m-k = 0 \rightarrow m=k \rightarrow y = x+k \rightarrow \frac{-1+k}{1}$

$m-k < 0 \rightarrow m < k \rightarrow m \in \{1, 2, 3\}$

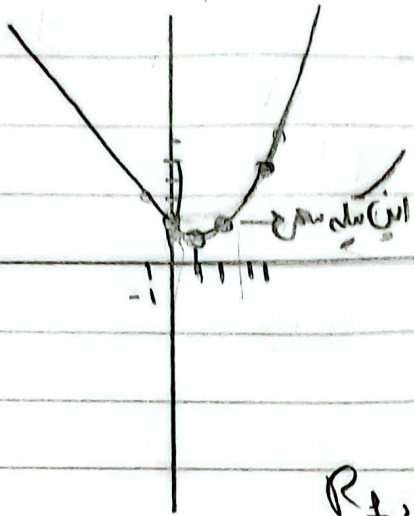
$m-k > 0 \rightarrow m > k \rightarrow m \in \mathbb{R}$



Genobar

۷- بر تابع $f(x)$ که به صورت زیر است

$$f(x) = \begin{cases} x+2 & x \geq 2 \\ x^2-2x+2 & 0 \leq x < 2 \\ |x|+2 & x < 0 \end{cases}$$



$$x+2 \quad x \geq 2$$

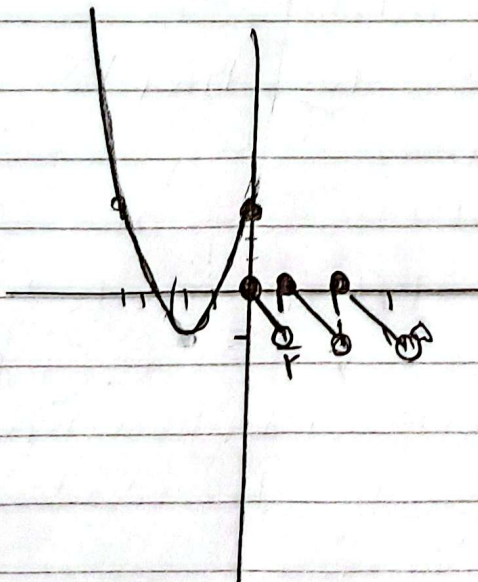
$$x^2-2x+2 \quad 0 \leq x < 2$$

$$|x|+2 \quad x < 0$$

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

۸- بر تابع $f(x)$ که به صورت زیر است

$$f(x) = \begin{cases} x^2+2x+3 & x \leq 0 \\ [2x]-2x & x > 0 \end{cases}$$



$$x^2+2x+3 \rightarrow \frac{b}{2a} = \frac{-2}{2} = -1$$

$$x - 1 + 3 = -1$$

$$\frac{-2}{2} \mid \frac{-2}{2} \mid 0$$

$$\left[\frac{1}{2}x \right] - 2x \rightarrow \frac{1}{2} \mid 0 - 1 = -1$$

$$\left(\frac{1}{2}, 1 \right) \rightarrow \frac{1}{2} \mid 1 - 1 = 0$$

$$(1, 1) \mid 1 - 1 = 0$$

$$1 \mid 1 - 1 = 0$$

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



۹- اگر دانه در تابع $y = a + 1 - \sqrt{2x+3}$ به ترتیب ازهای $[b, \infty)$

و ده و ده (۱-۵) با شخص ab

$$y = a + 1 - \sqrt{2x+3}$$

$$D_f = 2x+3 \geq 0 \rightarrow 2x \geq -3 \rightarrow x \geq -\frac{3}{2} \rightarrow -\frac{3}{2} = b$$

$$y = a + 1 - \sqrt{2x+3} \rightarrow y \leq a \rightarrow a+1 = a \rightarrow a = 3$$

$$ab = 3 \times -\frac{3}{2} = -\frac{9}{2}$$

$$f(u) + g(u) = 3\sqrt{u+1} + 2\sqrt{1-u}, \quad f(u) = 2\sqrt{u+1} + 3\sqrt{1-u}$$

$$D_f D_g = y = \frac{f(u)}{2} - \frac{g(u)}{3}$$

$$F(x) = 2\sqrt{x+1} + 3\sqrt{1-x} \rightarrow D_f = x+1 \geq 0 \rightarrow x \geq -1$$

$$g(x) = 3\sqrt{1-x} \rightarrow 1-x \geq 0 \rightarrow x \leq 1 \rightarrow [-1, 1]$$

$$g(x), f(x) = 3\sqrt{1+2\sqrt{1-x^2}} \rightarrow g(x) = 3\sqrt{1+2\sqrt{1-x^2}} - f(x)$$

$$g(x) = 3\sqrt{(1-x)(1+x)} - f(x) =$$

$$g(x) = 3(\sqrt{1-x} + \sqrt{1+x}) - 2\sqrt{x+1} - 3\sqrt{1-x}$$

$$g(x) = 3\sqrt{1-x} + 3\sqrt{1+x} - 2\sqrt{x+1} - 3\sqrt{1-x}$$

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

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

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

$$x = -1 \rightarrow \sqrt{1+1} = \sqrt{2} \quad R_f = [0, \sqrt{2}]$$

$$x = 1 \rightarrow \sqrt{1-1} = 0$$

