

مبتدا شریفی

19, 70

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

$2g - 3f$

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

5 $g(x), D_g = \{(-1, 1), (0, 2), (1, 1)\}$

7 $D_f \cap D_g = \{(-1, 1), (0, 2), (1, 1)\}$

8 $2g = \{(-1, 2), (0, 4), (1, 2)\}$ $3f = \{(-1, 3), (0, 3), (1, 3)\}$

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

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

بازه $(-\infty, 2]$ باشد اجتماع برد تابع f و g

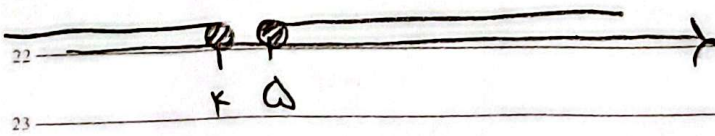
15 $f(x) = 2x - 1 \rightarrow [3, +\infty) \rightarrow 2x \geq 4 \rightarrow x \geq 2 \rightarrow 2x - 1 \geq 3$

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

17 $g(x) = \frac{1}{x} + 3 \rightarrow x \leq 2 \rightarrow \frac{1}{x} \geq \frac{1}{2} \rightarrow \frac{1}{x} + 3 \geq \frac{7}{2}$

18 $R_g = (-\infty, \frac{7}{2}]$

20 $R_f \cup R_g = (-\infty, \frac{7}{2}] \cup [3, +\infty)$



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 $\sqrt{b-a}$

$$f(x) = -\frac{x^2}{2} + x + 3$$

$$x_s = \frac{-b}{-2a} = 1 \xrightarrow{y_s} -\frac{1}{2} + 1 + 3 = \frac{5}{2}$$

$$-\frac{x^2}{2} + x + 3 = \frac{3}{2} \rightarrow -\frac{x^2}{2} + x + \frac{3}{2} = 0$$

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

$$-\frac{c}{a} = -\frac{\frac{3}{2}}{-\frac{1}{2}} = 3$$

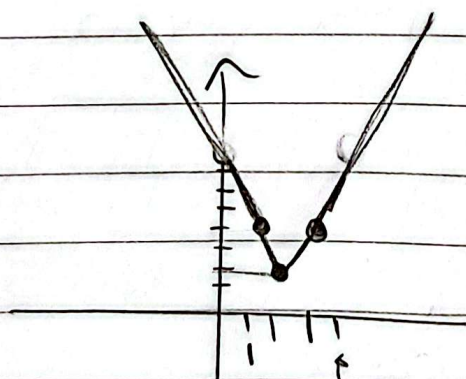
کمترین مقدار $y = \frac{|u-1|}{1} + \frac{|u-3|}{2} + \frac{|2u-4|}{2}$ از اصف سید

$$x+1-x+3 \rightarrow 2x+4 \quad x < 1$$

$$x-1-x+3-2x+4 \rightarrow -2x+4 \quad 1 < x < 2$$

$$x-1-x+3+2x-4 \rightarrow x-2 \quad 2 < x < 3$$

$$x-1+x-3+2x-4 \rightarrow 3x-8 \quad x > 3$$



min y = 2



برای $y = |x| - 2$ $|x+1|$ برآورد

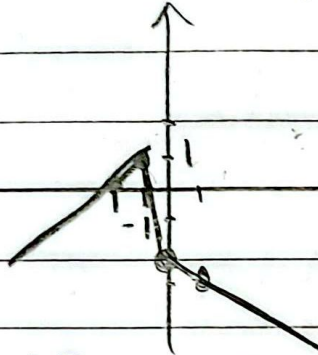
$$x - 2(x-1) \leq x+1 \rightarrow -x+2 \leq x+1 \rightarrow -x+2 \leq x+1$$

$$-x+2 \leq x+1 \rightarrow -2x \leq -1 \rightarrow x \geq \frac{1}{2}$$

$$x - 2x - 2 \leq x+1 \rightarrow -x-2 \leq x+1 \rightarrow -2x \leq 3 \rightarrow x \geq -\frac{3}{2}$$

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

5



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

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

$$y(x+1) = x^2 + ax + m \rightarrow x^2 + x(a-y) + m-y$$

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

$$a^2 + y^2 - 10y - 4m + 4y = y^2 - 4y - 4m + a^2$$

$$b^2 - 4ac \rightarrow 4y - (4)(1)(-4m + a^2) \rightarrow 4y + 16m - 4a^2$$

$$4y + 16m - 4a^2 \geq 0 \rightarrow 4y \geq 4a^2 - 16m \rightarrow y \geq a^2 - 4m$$

برای $R = [1, 2, 3]$ $K = 1$ $K = 2$ $K = 3$

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

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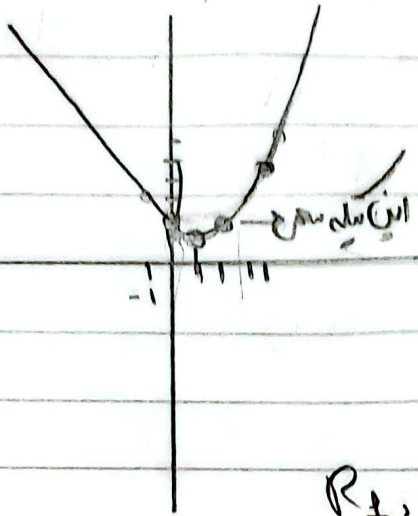
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Genobar

۷- بر تابع $f(x)$ را مشخص کنید

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



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

$$x^2-2x+2$$

x	$f(x)$
0	2
1	1
2	2

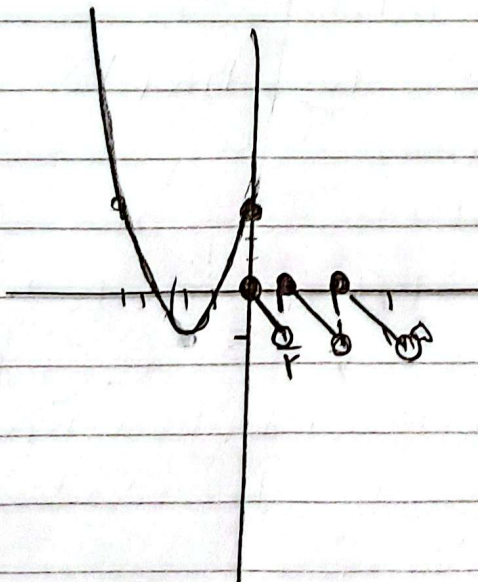
$$-\frac{b}{2a} = 1 \rightarrow x=1$$

x	$f(x)$
0	-1
2	2

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

۸- بر تابع $f(x)$ را مشخص کنید

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



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

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

x	$f(x)$
-1	2
0	3

$$[2x] - 2x$$

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

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

$$1 - 1 = -1$$

$$(1, 1.5) \rightarrow 1.5 - 1 = 0.5$$

$$1.5 - 1.5 = -1$$

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



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

و دانه ۱-۵۰ با شخص ab

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

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

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

$$ab = 1 \cdot \left(-\frac{3}{2}\right) = -\frac{3}{2}$$

۱۰- اگر $f(x) = 2\sqrt{x+1} + 5\sqrt{1-x}$ و $f(x) + g(x) = 3\sqrt{x+1} + 2\sqrt{1-x}$

و $D_f = D_g$ بر تابع $y = \frac{f(x)}{g(x)}$ را مشخص کنید

$$F(x) = 2\sqrt{x+1} + 5\sqrt{1-x} \rightarrow D_f = \{x \mid x+1 \geq 0 \text{ and } 1-x \geq 0\}$$

$$x+1 \geq 0 \rightarrow x \geq -1$$

$$1-x \geq 0 \rightarrow x \leq 1 \rightarrow [-1, 1]$$

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

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

$$g(x) = 3(\sqrt{1-x} + \sqrt{1+x}) - 2\sqrt{x+1} - 4\sqrt{1-x}$$

$$g(x) = 3\sqrt{1-x} + 3\sqrt{1+x} - 2\sqrt{x+1} - 4\sqrt{1-x}$$

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

$$h = \frac{f(x)}{g(x)} = \frac{g(x)}{f(x)} \rightarrow \frac{x(\sqrt{x+1} + 2\sqrt{1-x})}{\sqrt{x+1} - \sqrt{1-x}}$$

$$\frac{\sqrt{x+1} + 2\sqrt{1-x} - \sqrt{x+1} + \sqrt{1-x}}{\sqrt{x+1} - \sqrt{1-x}} \rightarrow \frac{3\sqrt{1-x}}{\sqrt{x+1} - \sqrt{1-x}}$$

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

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

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

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