

الف) $y = (x - 2[\frac{x}{2}])^2$

$(2(\frac{x}{2} - [\frac{x}{2}]))^2$

$[0, 1)$

$[0, 2)$

ب) $-\sin x + \log y - 4 \leq 0$

$\log y - 4 = \sin x$ $1000 \leq y \leq 100000$

$-1 \leq \log y - 4 \leq 1$

$3 \leq \log y \leq 5$

$\log 1000 \leq \log y \leq \log 100000$

$R_y = [1000, 100000]$

$f(x) = \sqrt{\frac{x^2-4}{x^2-9}}$ $\rightarrow \frac{x^2-4}{x^2-9}$

$x^2=0 \rightarrow \frac{4}{9}$

$x^2=+\infty \rightarrow 1$

$(-\infty, \frac{4}{9}] \cup (1, +\infty)$

$\rightarrow R_f = [0, \frac{4}{9}] \cup (1, +\infty)$

$\rightarrow \frac{a}{b} + \frac{c}{d} = \frac{a}{b}$

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

$x + \frac{1}{x} \Rightarrow (-\infty, -2] \cup [2, +\infty)$

زیر رادیکال باید مثبت باشد

$y = t + 2\sqrt{t} \rightarrow D_t = [2, +\infty)$

$-1 = \text{ext} \Rightarrow$

ب) $y = (2 - \sin x)(1 + \sin x)$

$-\sin^2 x + 2\sin x + 2 = y$

$\sin x = -1 \rightarrow 0$

$\sin x = +1 \rightarrow 4$

$\sin x = \frac{b}{a} \rightarrow 1 \rightarrow 4$

$R_y = [0, 4]$

$f(x) = -\frac{1}{3}x + 10$

$D_f = \{1, 2, 3, \dots, 9\}$

$x=1 \rightarrow 9\frac{2}{3}$

$x=2 \rightarrow 9\frac{1}{3}$

$x=3 \rightarrow 9$

$x=4 \rightarrow 8\frac{2}{3}$

$x=5 \rightarrow 8\frac{1}{3}$

$x=6 \rightarrow 8$

$x=7 \rightarrow 7\frac{2}{3}$

$x=8 \rightarrow 7\frac{1}{3}$

$x=9 \rightarrow 7$

$R_f = \{ \frac{29}{3}, \frac{28}{3}, 9, \frac{26}{3}, \frac{25}{3}, 8, \frac{23}{3}, \frac{22}{3}, 7 \}$

سوال مسئله معانی بردار می خواهد

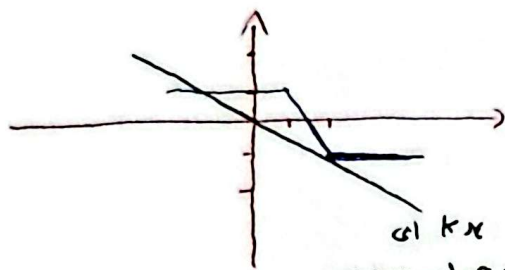
$Sn = \frac{9}{2} (12 + (8 \times \frac{1}{2})) = \frac{9}{2} \times 9 = 40.5$

$f(x) = \sqrt{ax^2 + bx + c} \rightarrow D_f = [2, +\infty) \rightarrow a = 0$

$\rightarrow bx + c = k(x - 2) \xrightarrow{f(2)=1} bx + c = x - 2 \rightarrow b = 1, c = -2$

$\rightarrow g(x) = \sqrt{x^2 + 4} \rightarrow R_{x^2+4} = [4, +\infty) \rightarrow R_g = [2, +\infty)$

$$|x-2| - |x-1| = kx$$



تنه
در جواب می ده

$$kx \xrightarrow{x=2} 2k = -1 \rightarrow k = -\frac{1}{2}$$

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$$a) y = x[x]$$

$$Dy = [-2, 2]$$

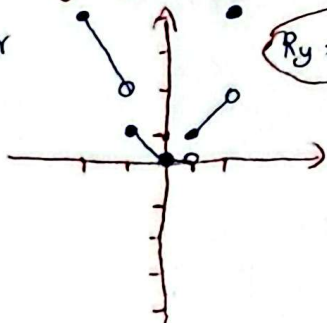
$$[-2, -1) \rightarrow -2x$$

$$[-1, 0) \rightarrow -x$$

$$[0, 1) \rightarrow 0$$

$$[1, 2) \rightarrow x$$

$$\{2\} \rightarrow 2x$$



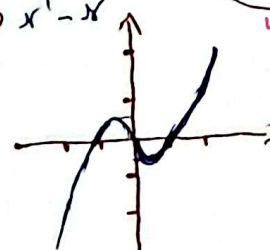
$$Ry = [0, 2] - \{2\}$$

$$b) y = x|x| - x \quad Dy = [-2, 2]$$

$$[-2, 0) \rightarrow -x^2 - x$$

$$[0, 2] \rightarrow x^2 - x$$

$$Ry = [-2, 2]$$



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$$y = \frac{1}{x} + \frac{1}{x+1} + \frac{1}{x^2+x} \rightarrow \frac{x+1+x+1}{x^2+x} = \frac{2(x+1)}{x^2+x} = \frac{2}{x} \rightarrow R = \{0\}$$

باید بدانیم باشد شکل آن عدد ۱ دارد دامنه توخالی است و نتیجه عدد ۲ دارد برد توخالی است

$$Ry = R - \{0\}$$

$$\frac{a}{x+b} = \frac{p}{-2}$$

۱, ۲, ۵

$$f(x) = \frac{x - 4\sqrt{x} + 3}{x - 4\sqrt{x} + 1} \rightarrow \frac{x - 2\sqrt{x} + 1 - 2\sqrt{x} + 2}{x - 2\sqrt{x} + 1} = \frac{(\sqrt{x}-1)^2 - 2(\sqrt{x}-1)}{(\sqrt{x}-1)^2}$$

$$\frac{(\sqrt{x}-1)(\sqrt{x}-1-2)}{(\sqrt{x}-1)^2} = \frac{\sqrt{x}-3}{\sqrt{x}-1} \quad \left\{ \begin{array}{l} \sqrt{x}=0 \rightarrow 3 \\ \sqrt{x}=+\infty \rightarrow 1 \end{array} \right\} \rightarrow (-\infty, 1) \cup [3, +\infty) = R_f$$

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

$$\rightarrow \frac{(x+1)((x+1)^2 - (x+3))}{(x+1)(x-1)} = \frac{x^2 + x - 2}{x-1} = \frac{(x-1)(x+2)}{(x-1)} \rightarrow$$

$$\rightarrow 1+3 = 4 \rightarrow R_f = R - \{1, 3\}$$

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