بکار دوامی

۱) $-2 \le \frac{3x+2}{5} \le 4 \longrightarrow -10 \le 3x+2 \le 20 \rightarrow -12 \le 3x \le 18 \rightarrow -4 \le x \le 6$

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۲)

$3x-2 \xrightarrow{-2} 3(-2)-2 = -8$

$\hookrightarrow 3 \quad 3(3)-2 = 7 \longrightarrow D = [-8, 7]$

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۳)

$\frac{3x+1}{2} \xrightarrow{x=-1} -1$

$\hookrightarrow x=3 \quad 5$

$\rightarrow -1 \le x < 5 \rightarrow -1 \le 2-5x < 5 \xrightarrow{-2} -3 \le -5x < 3$

$-1 \times$ لی $\quad -\frac{3}{5} < x \le \frac{3}{5} \longrightarrow D = (-\frac{3}{5}, \frac{3}{5}]$

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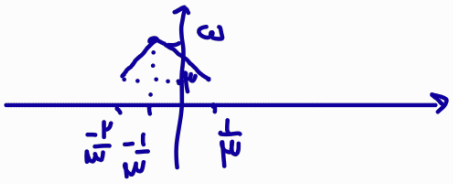
۴)

$x=0 \rightarrow y=1$

$3x+1=0 \rightarrow 3x=-1 \rightarrow x=\frac{-1}{3}, y=5$



$x=-1 \rightarrow y=0 \rightarrow 3x+1=-1 \rightarrow 3x=-2 \rightarrow x=\frac{-2}{3}, y=3$

$x=2, y=0 \rightarrow 3x+1=2 \rightarrow 3x=1 \rightarrow x=\frac{1}{3}, y=3$

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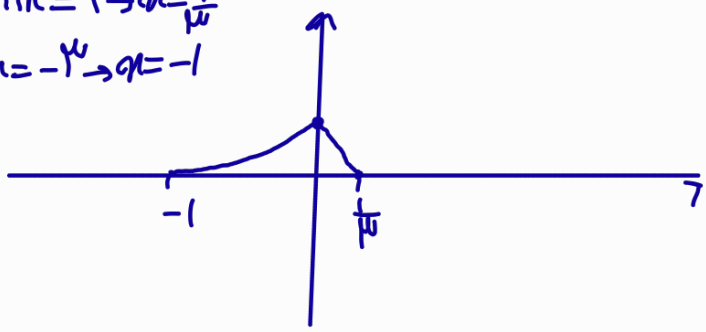
۵)

$(2,2) \rightarrow 2-3x=2 \rightarrow 3x=0 \rightarrow x=0, y=1$

$(1,0) \rightarrow 2-3x=1 \rightarrow 3x=1 \rightarrow x=\frac{1}{3}$

$(5,0) \rightarrow 2-3x=5 \rightarrow 3x=-3 \rightarrow x=-1$



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۶)

$y = -\frac{1}{3}(x^2 - \frac{6}{5}x) + 1 = -\frac{1}{3}\left((x-\frac{3}{5})^2 - \frac{9}{25}\right) + 1 = -\frac{1}{3}(x-\frac{3}{5})^2 + \frac{28}{25}$

$x_s = \frac{3}{5}, y_s = \frac{28}{25}$

$4 - \frac{3}{5} = \frac{17}{5} \qquad 3 - \frac{28}{25} = \frac{47}{25}$

$y = -\frac{1}{3}(x-4)^2 + 3 \xrightarrow{y=0}$

$\frac{1}{3}(x-4)^2 = 3 \rightarrow x = +7$

$x = +1$

۷)

$(1,4) \to 3x+2=1 \to 3x=-1 \to x=\frac{-1}{3} \to \alpha$

$y=1-4=-3 \to \beta$

$\to \alpha\beta = \frac{-1}{3}\times -3 = \frac{3}{3}$

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۸)

$f(x-1) \to 0 < x-1 \le 4 \to a+1 < x \le 5 \to a+1=-2 \to a=-3$

$g(x+1) \to -1 \le x+1 < b \to -2 \le x < b-1 \to b-1=5 \to b=6$

$a-b=-9$

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۹)

$D_{y_1}: [-3,5] \to -3 \le x \le 5 \to -\frac{1}{3} \le \frac{x}{3}+1 \le \frac{8}{3}$

$R_{y_1}: (-1,2] \to -1 \le f(x) \le 2 \to -5 \le 2f(x)-3 \le 1 \to 0 \le |2f(x)-3| \le 5$

$0 \le \sqrt{2f(x)-3} \le \sqrt{5} \to R_f = [0,\sqrt{5}]$

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۱۰)

$f(x)=\left|\frac{x+1}{2x+1}\right| \xrightarrow[\text{واحد بالا}]{2\text{ واحد راست}} \left|\frac{x-2+1}{2(x-2)+1}\right|+1 \to g(x)=\left|\frac{x-1}{2x-3}\right|+1$

$x+g(x)<0 \to x+\underbrace{\left|\frac{x-1}{2x-3}\right|}_{\text{همواره مثبت}}+1<0 \to x+1<0 \to x<-1$

داخل قدر مطلق $\begin{cases} x-1<-2 \\ 2x-3<-5 \end{cases}$ داخل قدر مطلق مثبت می‌شود

$x+g(x)<0 \to x+\left|\frac{x-1}{2x-3}\right|+1>0 \to x+1+\frac{x-1}{2x-3}>0 \to \frac{2(x^2-2)}{2x-3}<0$

منفی

$x^2-2>0 \to x>\sqrt{2}$ ، $x<-\sqrt{2}$ $\xrightarrow{x<-1}$ $(-\infty,-\sqrt{2})$