

$$D) f(x) = [-2, 4]$$

$$3x - 18 \quad \text{I: } \frac{3x+2-20}{5} < 0 \rightarrow x < 6$$

$$\text{II: } \frac{3x+12}{5} > 0 \rightarrow x > -4$$

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$$I \cup II = -4 < x < 6$$

$$-2 < x < 3 \xrightarrow{+3} -2 < 3x < 9 \xrightarrow{-2} -8 < 3x - 2 < 7$$

دقت به سوال

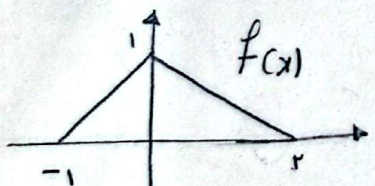
$$-1 < x < 3 \xrightarrow{+\frac{1}{2}} -\frac{1}{2} < \frac{3x}{2} < \frac{9}{2} \xrightarrow{+1} -\frac{1}{2} < \frac{3x+1}{2} < 5$$

$$\text{II: } -1 < 2 - 5x < 5$$

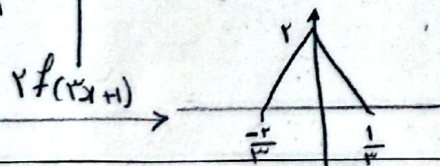
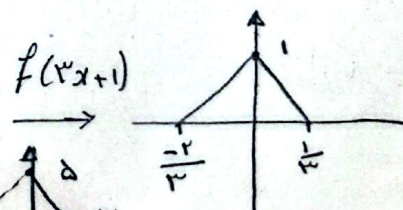
$$\text{I: } -2 < 5x \rightarrow -\frac{2}{5} < x$$

$$\text{II: } 5x < 3 \rightarrow x < \frac{3}{5}$$

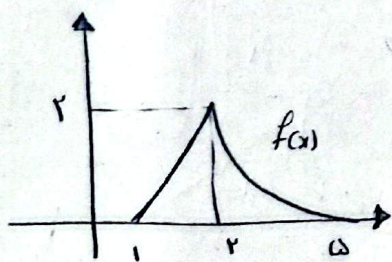
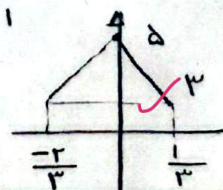
$$I \Rightarrow -\frac{2}{5} < x < \frac{3}{5}$$



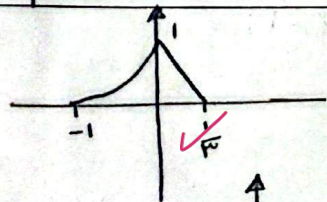
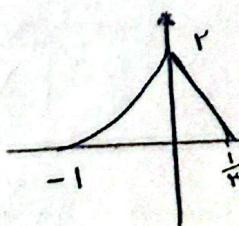
$$f(x+1)$$



$$2f(x+1) + 3$$



$$f(x-3)$$



$$\frac{1}{2} f(x-3)$$

$$f(x+2)$$

$$-\frac{1}{3} \left(x + \frac{3}{5}\right)^2 + \frac{11}{20} \rightarrow -\frac{1}{3} (x-4)^2 + 3 \rightarrow$$

$$-\frac{1}{3} x^2 + \frac{1}{2} x - \frac{1}{6} = 0 \quad \boxed{x=1}$$

صفحه آخر

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

$$\xrightarrow{2f(3x+2)} -2(3x+3)(3x-1) \xrightarrow{1-2f(3x+2)} 11 + 2(3x+3)(3x-1) = 18x^2 + 14x - 5$$

$$\begin{cases} x \geq -\frac{1}{3} \rightarrow \alpha \\ y \geq -1 \rightarrow \beta \end{cases} \rightarrow \alpha\beta = \frac{1}{3}$$

$$Df(x) \in (a, f] \rightarrow Df(x-1) = (a+1, f] \quad \begin{matrix} -2 \rightarrow a = -3 \end{matrix}$$

$$Dg(x) = [-1, b) \rightarrow Dg(x+1) = [-2, b-1) \quad \begin{matrix} (-2, 5) \\ b=6 \\ a=-1 \end{matrix}$$

$$a-b = -1-6 = -7$$

صفحه آخر

$$-3 < x \leq 5 \xrightarrow{+1} -2 < x+1 \leq 6 \xrightarrow{+1} -1 < x+2 \leq 7$$

نکته

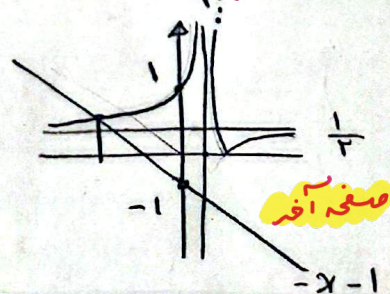
چون مقدار درجه اول از زمانه کمتر است
 به در واقع چون تابع از پیشه

صفحه آخر

$$f(x-1) = \left| \frac{x-1}{x-1} \right| + 1 = g(x)$$

$$x \in (-\infty, \frac{1-\sqrt{5}}{2})$$

$$x+1 + \left| \frac{x-1}{x-1} \right| < 0 \rightarrow \left| \frac{x-1}{x-1} \right| < -x-1$$



صفحه آخر

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

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$$\text{رأس: } (h, K) \xrightarrow{\text{معادله خط}} y = a(n-h)^2 + K = -\frac{1}{3}n^2 + \frac{2}{3}n + 1 \rightarrow a = -\frac{1}{3}$$

$$\text{رأس: } (4, 3) \rightarrow y = -\frac{1}{3}(n-4)^2 + 3 \xrightarrow{y=0} -\frac{1}{3}(n-4)^2 = -3 \rightarrow \begin{cases} n=7 \\ n=1 \end{cases}$$

$$D_f = (a, f] \rightarrow a < n-1 \leq f \rightarrow a+1 < n \leq f \Rightarrow D_{f(n-1)} = (a+1, f] \quad -^{\wedge}$$

$$D_g = [-1, b) \rightarrow -1 \leq n+1 < b \rightarrow -2 \leq n < b-1 \Rightarrow D_{g(n+1)} = [-2, b-1)$$

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$$D_{y_1} = [-3, 5] \rightarrow -3 \leq n \leq 5 \rightarrow -\frac{1}{3} \leq \frac{n}{3} + 1 \leq \frac{5}{3} \Rightarrow D_f = \left[-\frac{1}{3}, \frac{5}{3}\right]$$

$$R_{y_1} = [-1, 2] \rightarrow -1 \leq f \leq 2 \rightarrow -5 \leq 2f-3 \leq 1 \rightarrow 0 \leq |2f-3| \leq 5$$

$$0 \leq \sqrt{|2f-3|} \leq \sqrt{5} \Rightarrow R_f = [0, \sqrt{5}]$$

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$$g(n) = \left| \frac{(n-2)+1}{2(n-2)+1} \right| + 1 = \left| \frac{n-1}{2n-3} \right| + 1$$

$$n + g(n) < 0 \rightarrow \left| \frac{n-1}{2n-3} \right| < -1-n \rightarrow \text{از به قدر مطلق بزرگتر شد پس باید مثبت باشد: } -1-n > 0 \rightarrow n < -1$$

$$\xrightarrow{n < -1} \frac{n-1}{2n-3} < -1-n \rightarrow \frac{2n^2-4}{2n-3} < 0 \rightarrow \frac{2(n-\sqrt{2})(n+\sqrt{2})}{2n-3} < 0$$

