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$$-2 < \frac{3x+2}{5} < 4 \rightarrow -4 < x < 4 \rightarrow D_f = [-4, 4]$$

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$$R(3x-2) = D_f = [-8, 4] \checkmark$$

$$\hookrightarrow x \in [-2, 2]$$

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$$R\left(\frac{3x+1}{2}\right) = D_f = [-1, 5]$$

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

$$\hookrightarrow D_f' = \left(-\frac{3}{5}, \frac{3}{5}\right] \checkmark$$

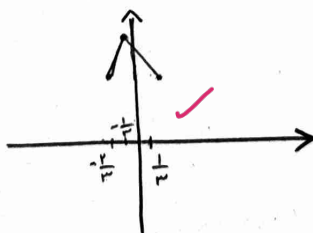
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$$(-1, 0) \rightarrow \left(-\frac{2}{3}, 3\right)$$

$$(0, 1) \rightarrow \left(-\frac{1}{3}, 5\right)$$

$$(2, 0) \rightarrow \left(\frac{1}{3}, 3\right)$$



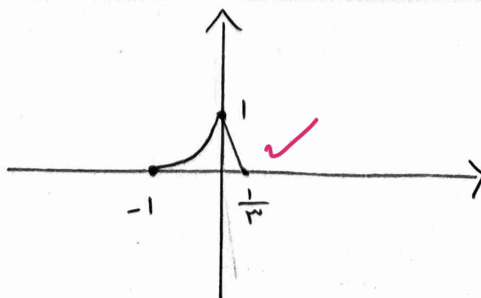
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$$(1, 0) \rightarrow \left(\frac{1}{3}, 0\right)$$

$$(2, 2) \rightarrow (0, 1)$$

$$(5, 0) \rightarrow (-1, 0)$$



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$$f(x) = -\frac{1}{3}x^3 + \frac{2}{3}x + 1 = -\frac{1}{3}\left(x - \frac{2}{3}\right)^3 + \frac{28}{27} \rightarrow \text{بزرگ‌ترین مقدار رأس سهم به تنه (۲,۳) است}$$

که باید $\frac{17}{3}$ به راست و $\frac{27}{3}$ به باطن بردیم

$$y' = f\left(x - \frac{17}{3}\right) + \frac{27}{3} \rightarrow f\left(x - \frac{17}{3}\right) + \frac{27}{3} = 0 \rightarrow f\left(x - \frac{17}{3}\right) = -\frac{27}{3}$$

$$\rightarrow f(x) = -\frac{27}{3} \rightarrow x = \frac{17}{3}, -\frac{17}{3} \rightarrow x - \frac{17}{3} = \frac{17}{3}, x - \frac{17}{3} = -\frac{17}{3} \rightarrow \boxed{x = 1, \checkmark}$$

$$\left. \begin{aligned} S_f \Big|_r &\rightarrow x_{S'} \rightarrow 3x + y = 1 \rightarrow x_{S'} \neq -\frac{1}{3} \\ &\rightarrow y_{S'} = 1 - 2(1) = -1 \end{aligned} \right\} S' \Big|_{\substack{-\frac{1}{3} = \alpha \\ -1 = \beta}} \checkmark$$

$$\rightarrow \alpha\beta = \frac{1}{3} \checkmark$$

$$\left. \begin{aligned} D_{f'} &= (a+1, r+1) \\ D_{g'} &= [-1-1, b-1] \end{aligned} \right\} D_{f'} \cap D_{g'} = (-2, 2) \rightarrow b-1 = 2 \rightarrow b = 4, a+1 = -2 \rightarrow a = -3$$

$$\rightarrow a \cdot b = -3 \cdot 4 = -12 \checkmark$$

$$R_{\left(\frac{x}{2}+1\right)} = D_{f(x)} = \left[-\frac{1}{2}, \frac{1}{2}\right]$$

$$y_r = \sqrt{|2f(x) - 3|} \rightarrow \text{محدوده مثبت} \rightarrow D_{y_r} \in \left[-\frac{1}{2}, \frac{1}{2}\right] \checkmark$$

$$R_{f\left(\frac{x}{2}+1\right)} = R_{f(x)} = [-1, 2] \rightarrow 2f - 3 \in [-2, 1] \rightarrow R_{y_r} = \sqrt{|[-2, 1]|} = [0, \sqrt{2}] \checkmark$$

$$f(x) = \left| \frac{x+1}{x^2-1} \right| \xrightarrow{\text{محدوده مثبت}} f(x-2) = \left| \frac{x-1}{x^2-3} \right| \xrightarrow{\text{محدوده مثبت}} f(x-2)+1 = \left| \frac{x-1}{x^2-3} \right| + 1 = g(x)$$

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

$$\left. \begin{aligned} 1 < x < \frac{3}{2} \rightarrow x+1 - \frac{x-1}{x^2-3} < 0 &\rightarrow \frac{x^3 - 3x^2 + 2x - 3 - x + 1}{x^2-3} < 0 \rightarrow \frac{x^3 - 3x^2 + x - 2}{x^2-3} < 0 \rightarrow \frac{(x-2)(x^2 - x - 1)}{(x-\sqrt{3})(x+\sqrt{3})} < 0 \\ x > \frac{3}{2}, x < 1 &\rightarrow x+1 + \frac{x-1}{x^2-3} < 0 \rightarrow \frac{x^3 - 3x^2 + 2x - 3 + x - 1}{x^2-3} < 0 \rightarrow \frac{x^3 - 3x^2 + 3x - 4}{x^2-3} < 0 \rightarrow \frac{(x-\sqrt{3})(x^2 - 2x - \sqrt{3})}{(x-\sqrt{3})(x+\sqrt{3})} < 0 \end{aligned} \right\} x \in (-\infty, -\sqrt{3}] \checkmark$$