

الف) $y'' - n = 2n' \rightarrow y' = 2n' + n \rightarrow \begin{cases} y_1' = 2n' + n \\ y_2' = 2n' + n \end{cases} \rightarrow y_1' = y_2' \rightarrow \text{تبعیت} \checkmark$

ب) $|y| + n' = n + c \rightarrow |y| = -(n' - n - c) \rightarrow \begin{cases} |y_1| = -(n' - n - c) \\ |y_2| = -(n' - n - c) \end{cases} \rightarrow |y_1| = |y_2| \rightarrow y_1 = \pm y_2 \rightarrow \text{تبعیت} \checkmark$

ج) $\sqrt{n - c} + |y - 2| = 0 \rightarrow \sqrt{n - c} = -|y - 2| \rightarrow \begin{cases} n - c = 0 \rightarrow n = c \\ y - 2 = 0 \rightarrow y = 2 \end{cases} \rightarrow \text{تبعیت} \checkmark$

د) $n = \cos y \rightarrow n = 1 \rightarrow y = \{0, 2\pi, 4\pi, 6\pi, 8\pi, \dots\} \rightarrow \text{تبعیت} \times$

الف) $y = \frac{n + c}{n' - c n} \rightarrow n' - c n \neq 0 \rightarrow n(n - c) \neq 0 \rightarrow \begin{cases} n \neq 0 \\ n \neq c \end{cases} \rightarrow D_f = \mathbb{R} - \{0, c\}$

ب) $y = \frac{n + c}{n' - \sqrt{n + 4}} \rightarrow n' - \sqrt{n + 4} \neq 0 \rightarrow \Delta < 0 \rightarrow \text{تبعیت} \rightarrow D_f = \mathbb{R}$

ج) $y = \frac{n + c}{n' + n + c} \rightarrow \Delta < 0 \rightarrow \text{تبعیت} \rightarrow D_f = \mathbb{R}$

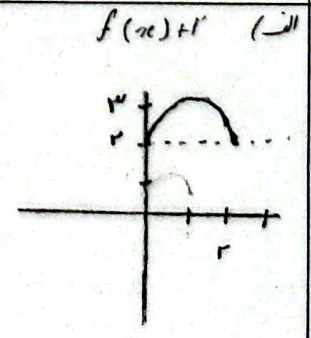
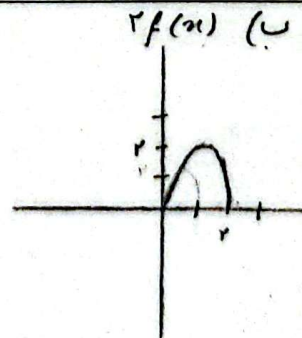
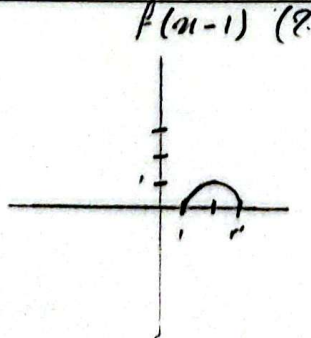
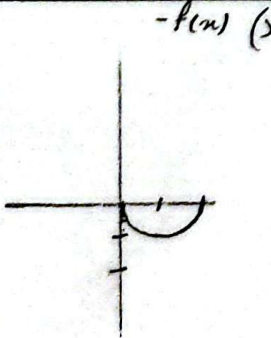
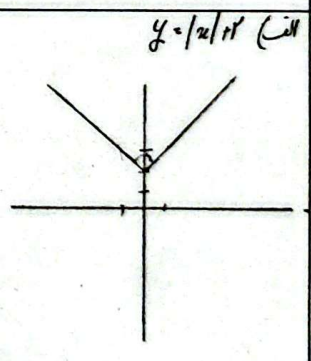
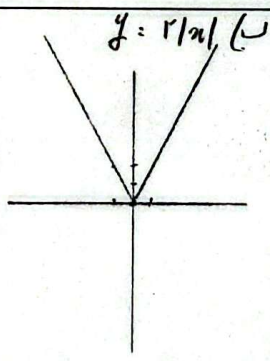
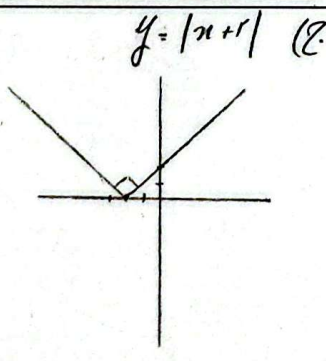
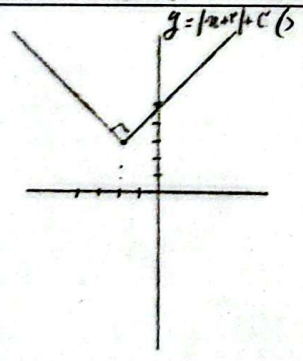
د) $y = \frac{n + c}{n' - c n'} \rightarrow n' - c n' \neq 0 \rightarrow n'(n' - c) \rightarrow \begin{cases} n' \neq 0 \\ n' \neq c \end{cases} \rightarrow D_f = \mathbb{R} - \{0, c\}$

الف) $y = \sqrt{4 - n} + \sqrt{n - 2} \rightarrow \begin{cases} 4 - n \geq 0 \rightarrow 4 \geq n \\ n - 2 \geq 0 \rightarrow n \geq 2 \end{cases} \rightarrow 4 \geq n \geq 2 \rightarrow D_f = [2, 4]$

ب) $y = \frac{c n + 1}{n' + 1} \rightarrow n' + 1 \neq 0 \rightarrow n' \neq -1 \rightarrow D_f = \mathbb{R}$

ج) $y = \frac{\sqrt{n - 2}}{n - c} \rightarrow \frac{1}{n - c} \rightarrow D_f = (-\infty, 2] \cup (c, +\infty)$

د) $y = \frac{2n + c}{|n| + n'} \rightarrow |n| + n' \neq 0 \rightarrow n \neq 0 \rightarrow D_f = \mathbb{R} - \{0\}$



الف) $y = (x-r)(x-c)(x-e) \rightarrow$ $\begin{array}{c} r \quad c \quad e \\ - \quad + \quad - \quad + \end{array}$ $\rightarrow$ $\begin{array}{l} \text{if } x = (-\infty, r) \cup (e, +\infty) \rightarrow y < 0 \\ \text{if } x = \{r, c, e\} \rightarrow y = 0 \\ \text{if } x = (r, c) \cup (c, e) \rightarrow y > 0 \end{array}$

ب) $y = (x-r)(x-r)^2(x-e) \rightarrow$ $\begin{array}{c} r \quad c \quad e \\ + \quad - \quad - \quad + \end{array}$ $\rightarrow$ $\begin{array}{l} \text{if } x = (r, c) \cup (c, e) \rightarrow y < 0 \\ \text{if } x = \{r, c, e\} \rightarrow y = 0 \\ \text{if } x = (-\infty, r) \cup (e, +\infty) \rightarrow y > 0 \end{array}$

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الف) $y = \frac{(x-r)(x-e)}{x-r} \rightarrow$ $\begin{array}{c} r \quad c \quad e \\ - \quad + \quad - \quad + \\ \text{موجب} \quad \text{موجب} \quad \text{موجب} \quad \text{موجب} \end{array}$

ب) $y = \frac{(x-r)(x-e)}{(x-c)^2} \rightarrow$ $\begin{array}{c} r \quad c \quad e \\ + \quad - \quad - \quad + \\ \text{موجب} \quad \text{موجب} \quad \text{موجب} \quad \text{موجب} \end{array}$

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الف) $y = \frac{x^3 - 3x^2 + 2x}{x - 3} \rightarrow \frac{(x-1)(x^2 + x - 2)}{x - 3} \rightarrow \frac{-1 \pm \sqrt{1+1}}{2} = \frac{-1 \pm \sqrt{2}}{2}$ $\begin{array}{c} r \quad c \quad e \\ + \quad - \quad - \quad + \end{array}$

ب) $y = \frac{x^3 - 3x^2 + 2x}{x^2 - 4x + 3} \rightarrow \frac{(x-1)(x-1)}{(x-1)(x-3)} \rightarrow \frac{1}{x-3}$ $\begin{array}{c} r \quad c \\ + \quad - \quad + \end{array}$

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الف) $y = \frac{x^3 - x^2}{x^2 + x + 2} \rightarrow \frac{x^2(x-1)}{x(x+1)+2} \rightarrow$ $\begin{array}{c} -1 \quad 0 \quad 1 \\ + \quad - \quad - \quad + \end{array}$

ب) $y = \frac{x^3 + 9x^2 + 8x}{x^2 + 2x + 3} \rightarrow \frac{x^2(x+8)}{(x+3)(x+1)} \rightarrow$ $\begin{array}{c} -2 \quad -1 \\ + \quad - \quad + \end{array}$

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الف) $y = \sqrt{\frac{x^3-1}{x^3-x}} = \sqrt{\frac{x^3-1}{x(x^2-1)}} \rightarrow$ $\begin{array}{c} -1 \quad 0 \quad 1 \\ + \quad - \quad + \end{array}$
 $\rightarrow D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

ب) $y = \sqrt{\frac{x^3-14}{x^3-4x+3}} = \sqrt{\frac{(x+3)(x-4)}{(x-1)(x-3)}} \rightarrow$ $\begin{array}{c} -4 \quad 1 \quad 3 \\ + \quad - \quad + \end{array}$
 $\rightarrow D_f = (-\infty, -4] \cup (1, 3) \cup (3, +\infty)$

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