

حل ۱

$$\left. \begin{aligned} y_1' &= 2x' + x \\ y_2' &= 2x' + x \end{aligned} \right\} y_1' = y_2' \Rightarrow \sqrt{y_1'} = \sqrt{y_2'} \Rightarrow y_1 = y_2$$

تابع

۱) $x \leq 2 \Rightarrow |y| + 1 \leq 1 \Rightarrow |y| \leq 0 \Rightarrow y = 0$ تابع نیست

۲) $\sqrt{x-4} \leq -|y-2| \Rightarrow \sqrt{x-4} \leq 0$

$$\begin{cases} \rightarrow \sqrt{x-4} < 0 \quad \times \\ \rightarrow \sqrt{x-4} = 0 \end{cases}$$

$\Rightarrow -|y-2| = 0 \Rightarrow y = 2$

تابع

۳) $x \leq \cos y \rightarrow \cos y \leq -1 \rightarrow 2k\pi + \pi \rightarrow 180^\circ, 450^\circ, \dots$

تابع نیست

حل ۲

۱) $x' - 4x \neq 0 \Rightarrow x' \neq 4x \Rightarrow x \neq 4$

$\Rightarrow D_f = \mathbb{R} - \{4\}$

۲) $x' - 4x + 14 \neq 0 \Rightarrow x \neq \frac{4 \pm \sqrt{16 - 44}}{2} \quad \times$

$\Rightarrow D_f = \mathbb{R}$

۳) $x' + x + 4 \neq 0 \Rightarrow x \neq \frac{-1 \pm \sqrt{1 - 14}}{2} \quad \times$

$\Rightarrow D_f = \mathbb{R}$

۴) $x' - 4x' \neq 0 \Rightarrow x' \neq 4x' \Rightarrow x' \neq 4 \Rightarrow x \neq \pm 2$

$\Rightarrow D_f = \mathbb{R} - \{\pm 2\}$

1) $4-x \geq 0, x-2 \geq 0$

1.5

$$\left. \begin{array}{l} 4-x \geq 0 \Rightarrow 4 \geq x \\ x-2 \geq 0 \Rightarrow x \geq 2 \end{array} \right\} \Rightarrow 4 \geq x \geq 2 \Rightarrow P_f = [2, 4]$$

2) $x^2 + 1 \neq 0 \Rightarrow x^2 \neq -1 \quad \times$

$\Rightarrow P_f = \mathbb{R}$

3) $x-2 \geq 0 \Rightarrow x \geq 2$

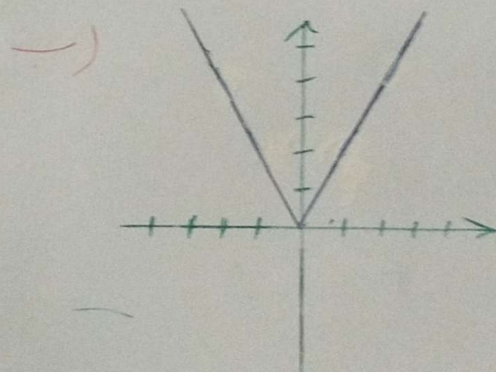
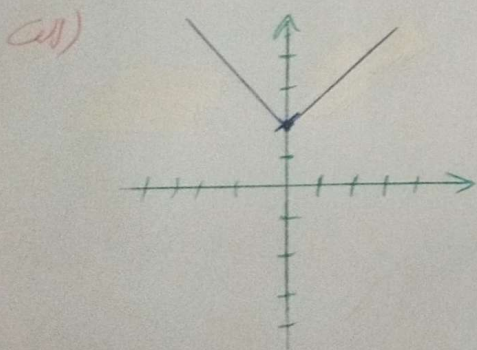
$x-4 \neq 0 \Rightarrow x \neq 4$

$\Rightarrow P_f = [2, 4) \cup (4, +\infty)$

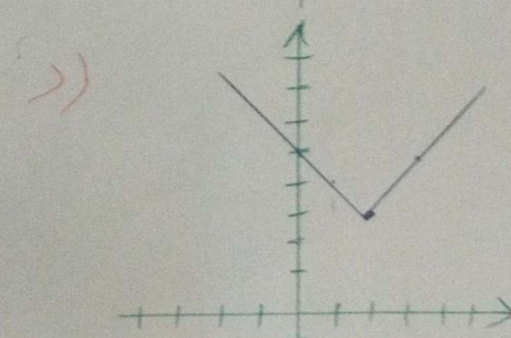
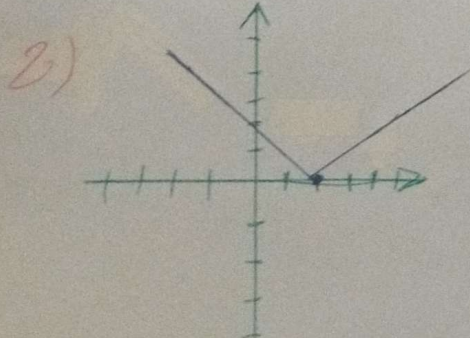
4) $|x| + x^2 \neq 0$

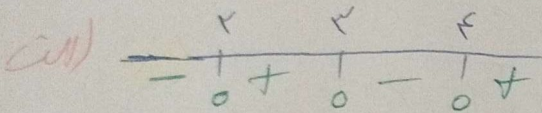
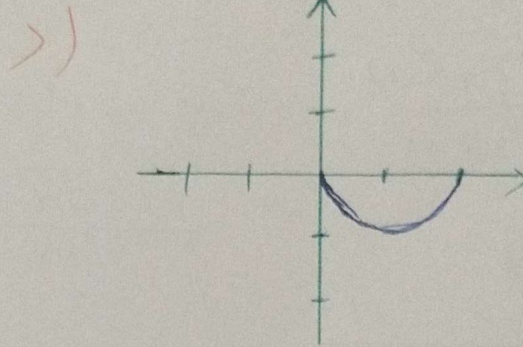
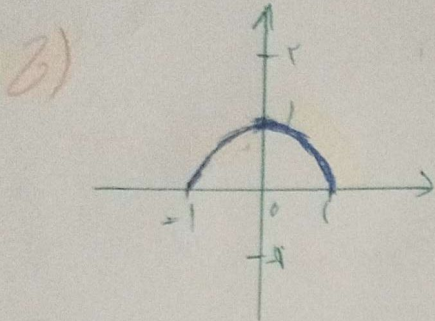
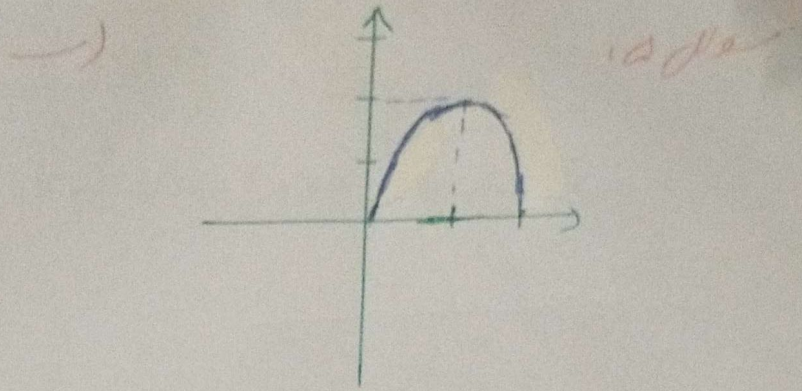
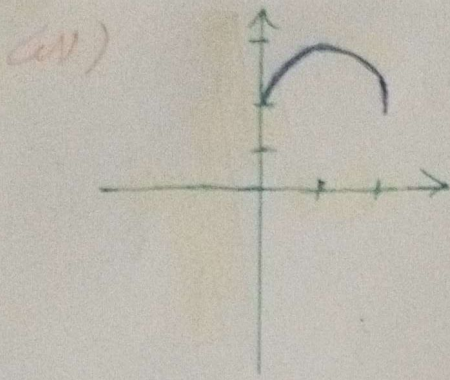
$\Rightarrow |x| \neq -x^2$

$\Rightarrow P_f = \mathbb{R}$

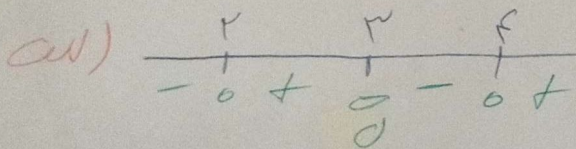
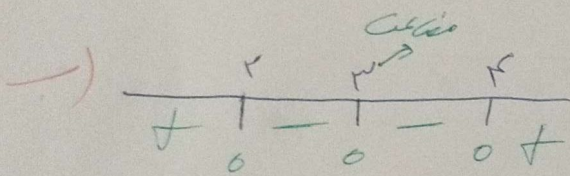


1.5

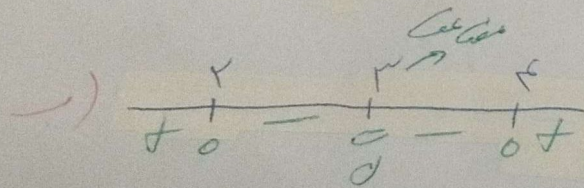




14

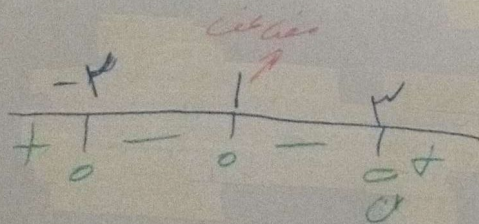


15



an) $\frac{1}{x-1}$ dan $\frac{1}{x-2}$ → $\frac{1}{(x-1)(x-2)}$ → $\frac{1}{x^2-3x+2}$ → $\frac{1}{(x-1)(x-2)}$

16



$$\text{---) } \varepsilon_{\text{شماره}} \rightarrow x^2 - 3x + 2 \xrightarrow{\text{جمع فرم}} 1, \frac{c}{a} \Rightarrow 1, 2$$

$$\varepsilon_{\text{شماره}} \rightarrow x^2 - 4x + 3 \xrightarrow{\text{جمع فرم}} 1, \frac{c}{a} \Rightarrow 1, 3$$

$$\text{Case 1: } \begin{array}{c|c|c} 1 & 2 & 3 \\ \hline + & + & - \\ 0 & 0 & 0 \end{array}$$

$$\text{Call) } \frac{x^2(x^2-1)}{x^2+x+2} \rightarrow \varepsilon_{\text{شماره}} \rightarrow x^2+x+2$$

$$\rightarrow \frac{-1 \pm \sqrt{1-8}}{2} \rightarrow \text{ریشه های کسری}$$

$$\begin{array}{c|c|c} -1 & 0 & +1 \\ \hline - & + & - \\ 0 & 0 & 0 \end{array}$$

$$\text{---) } \varepsilon_{\text{شماره}} \rightarrow x^2 + 3x + 2 \rightarrow \frac{-3 \pm \sqrt{9-4}}{2} \rightarrow \text{ریشه های کسری}$$

$$\varepsilon_{\text{شماره}} \rightarrow x^2 + 2x + 2 \rightarrow \frac{-2 \pm \sqrt{4-4}}{2} \rightarrow \text{ریشه های کسری}$$

$$\rightarrow \varepsilon_{\text{شماره}} \Rightarrow \frac{\quad}{+}$$

$$\text{Call) } x^2 - x \neq 0 \Rightarrow x(x-1) \neq 0 \Rightarrow x \neq 0, \pm 1 \rightarrow \text{ریشه های کسری}$$

$$\frac{x^2-1}{x^2-x} \geq 0 \Rightarrow \begin{array}{c|c|c} -1 & 0 & 1 \\ \hline + & - & + \\ 0 & 0 & 0 \end{array}$$

$$\rightarrow D_f = (-1, -\infty) \cup (0, 1) \cup (1, +\infty)$$

$$\text{---) } \varepsilon_{\text{شماره}} \rightarrow x^2 - 4x + 4 \xrightarrow{\text{جمع فرم}} 1, 4 \mid x^2 - 14 \leq 0 \Rightarrow \varepsilon_{\text{شماره}} \leq \pm 4$$

$$\begin{array}{c|c|c} -4 & 1 & 4 \\ \hline + & - & + \\ 0 & 0 & 0 \end{array} \rightarrow D_f = [-\infty, -4) \cup (1, 4) \cup (4, +\infty)$$