

۱- $y^3 - x = 2x^2 \rightarrow y^3 = x + 2x^2 \Rightarrow y = \sqrt[3]{x + 2x^2}$

زیر رادیکال منفی نمی شود و مرتبه ۳- تایی ندارد تابع است

$\rightarrow |y| + x^2 = x + 3 \quad |y| = -x^2 + x + 3 \Rightarrow |y_1| = |y_2|$

$y_1 = \pm y_2$ تابع نیست $|y_1| = -x^2 + x + 3$

ج) $\sqrt{x-4} + |y-2| = 0 \rightarrow |y-2| = \sqrt{x-4}$ قد رطوبت مثبت درمی آید
همچون منفی نمی شود
تابع است

ب) $x = \cos y \Rightarrow y = \frac{\pi}{2}, \frac{3\pi}{2}$ تابع نیست

۲- الف) $y = \frac{x+4}{x^2-4x} = \frac{x+4}{x(x-4)} \neq 0 \Rightarrow x=0 \quad x=+4 \quad \mathbb{R} - \{0, +4\}$

ب) $y = \frac{x+4}{x^2-7x+14} = \Delta \bar{w}$
 $\Delta = b^2 - 4ac \Rightarrow 49 - 4(14)(1) = \Delta < 0 \quad \mathbb{R}$

ج) $y = \frac{x+2}{x^2+x+2} = \Delta \bar{w}$
 $b^2 - 4ac = 1 - 4(1)(2) = \Delta < 0 \quad \mathbb{R}$

د) $y = \frac{x+2}{x^2-4x^2} \Rightarrow x^2(x^2-4) \Rightarrow x^2(x-2)(x+2) \quad \mathbb{R} - \{-2, 0, +2\}$

الف) $y = \sqrt{4-x} + \sqrt{x-2} \geq 0 \rightarrow x \geq 2 \quad 2 \leq x \leq 4$
 $x \geq 4 \quad [2, 4]$

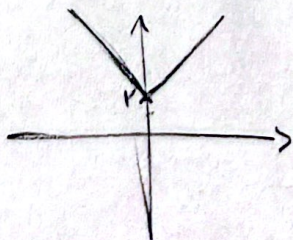
ب) $y = \frac{3x+1}{x^2+1} > 0 \quad D = \mathbb{R}$ زیرا توان ۲ همیشه مثبت است

ج) $\sqrt{x-2} > 0 \rightarrow 2$
 $x-4 \geq 0 \rightarrow 4 \quad [2, 4) \cup (4, +\infty)$

د) $y = \frac{2x+3}{|x|+x^2} > 0 \quad D = \mathbb{R}$

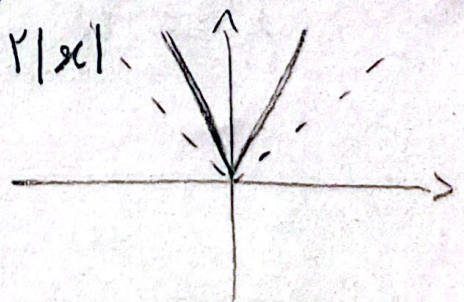
الف)

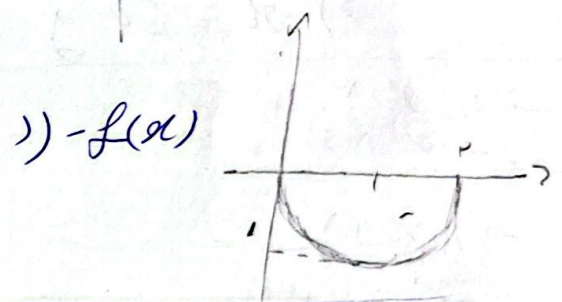
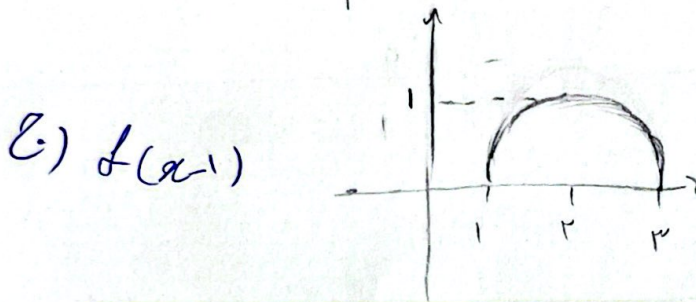
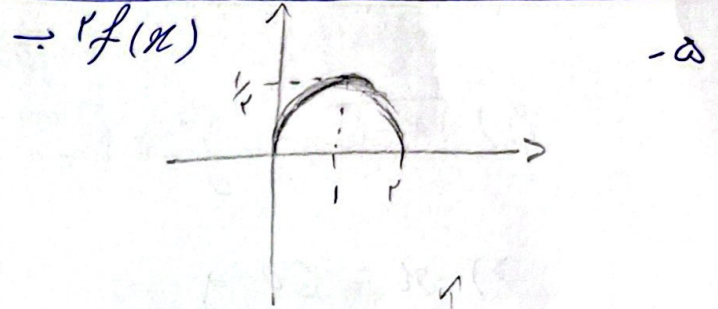
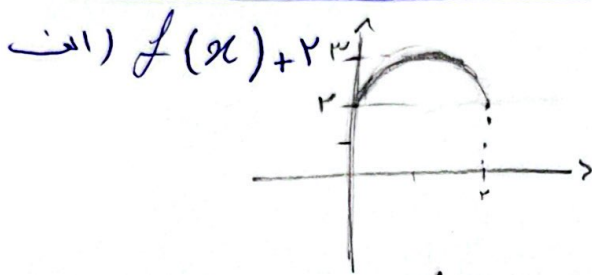
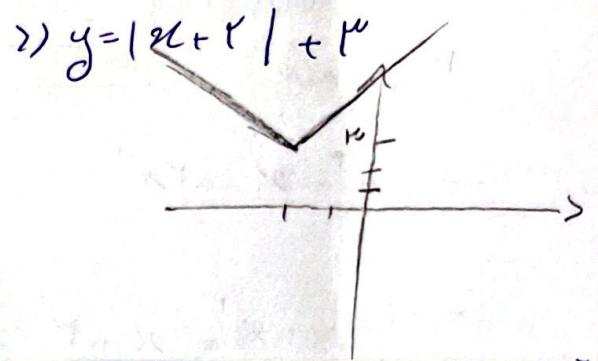
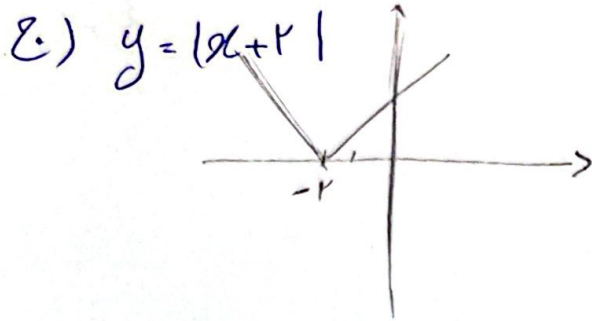
$y = |x| + 2$



ب)

$y = 2|x|$





الف) $y = (x-2)(x-3)(x-5)$ $\begin{array}{c} 2 \quad 3 \quad 5 \\ - \quad + \quad - \end{array}$ $D = \mathbb{R}$ -7

ب) $y = (x-2)(x-3)^2(x-5)$ $\begin{array}{c} 2 \quad 3 \quad 5 \\ + \quad - \quad - \end{array}$

الف) $\frac{(x-2)(x-5)}{x-3}$ $\begin{array}{c} 2 \quad 3 \quad 5 \\ - \quad + \quad - \end{array}$ $\mathbb{R} - \{3\}$ -11

ب) $\frac{(x-2)(x-5)^2}{(x-3)^2}$ $\begin{array}{c} 2 \quad 3 \quad 5 \\ + \quad - \quad + \end{array}$ $\mathbb{R} - \{3\}$

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

ب) $y = \frac{x^3 - 3x + 2}{x^2 - 5x + 3} = \frac{(x-2)(x-1)(x+1)}{(x-3)(x-1)} = \frac{(x-2)(x+1)}{x-3}$ $\begin{array}{c} 1 \quad 2 \quad 3 \\ + \quad - \quad + \end{array}$ $\mathbb{R} - \{1, 3\}$

الف) $\frac{x^4 - x^2}{x^2 + x + 2} = \frac{x^2(x^2 - 1)}{x^2 + x + 2} = \frac{x^2(x-1)(x+1)}{x^2 + x + 2}$

Sign chart: $\frac{-1}{-} \frac{+1}{+} \frac{+1}{-}$

$\Delta: b^2 - 4ac \rightarrow 1 - 4(1)(2) = -7 \Delta < 0$

$\Rightarrow \frac{x^2 + 3x + 2}{x^2 + 2x + 3} = \Delta \rightarrow b^2 - 4ac = 9 - 4(1)(3) = -3 \Delta < 0$

$\Delta \rightarrow 4 - 4(3)(1) = -8 \Delta < 0$

Sign chart: $\frac{-1}{-} \frac{+1}{+} \frac{-1}{-}$

المرحلة

الف) $y = \sqrt{\frac{x^3 - 1}{x^3 - x}} = \sqrt{\frac{(x-1)(x^2 + x + 1)}{x(x+1)(x-1)}}$

Sign chart: $\frac{+1}{+} \frac{-1}{-} \frac{+1}{+}$

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

$\Rightarrow y = \sqrt{\frac{x^2 - 4}{x^2 - 2x + 2}} = \sqrt{\frac{(x-2)(x+2)}{(x-1)(x-1)}}$

Sign chart: $\frac{-1}{+} \frac{+1}{-} \frac{+1}{+}$

$(-\infty, -2] \cup (1, 2) \cup (2, +\infty)$