

سوال ۱: $y^3 = y^2 \rightarrow y_1 = y_2$

الف) $y^3 - x = 2x^2$

تابع هست

ب) $y^3 = x \Rightarrow y = \sqrt[3]{x}$ و $y^3 = x + 2x^2$ جواب دارد، $y^3 = x - x = 2x^2$ جواب ندارد، $y^3 = x + 2x^2$ جواب دارد، $y^3 = x + 2x^2$ جواب دارد.

ج) $|y| + x^2 = x + 2$

تابع نیست. اگر $y = 1$ یا $y = -1$ باشد جواب ندارد و برای $y = 0$ جواب داریم.

د) $y = 1$ یا $y = -1$ یا $y = 0$

ه) $\sqrt{x-4} + |y-2| = 0$

ج) $\sqrt{x-4} + |y-2| = 0 \Rightarrow x=4, y=2$

د) $x = \cos y$

ه) $x = 0$ یا $y = \pi, 2\pi$

الف) $y = \frac{x+5}{x^2-4x}$

$\mathbb{R} - \{0, 5\} = f(x)$

سوال ۲

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ب) $y = \frac{x+5}{x^2-7x+14}$

$x^2 - 7x + 14 \neq 0$

$\rightarrow \mathbb{R} = f(x)$ (در هیچ صورتیخرج نمی شود)

ج) $y = \frac{x+5}{x^2+x+5}$ $\rightarrow f(x) = \mathbb{R}$ (در هیچ صورتیخرج نمی شود)

د) $y = \frac{x+5}{x^2-4x^2}$ $f(x) = \mathbb{R} - \{0, 5\}$

الف) $y = \sqrt{4-x} + \sqrt{x-2}$ $f(x) = (-\infty, 2] \cup [4, +\infty)$

سوال ۳

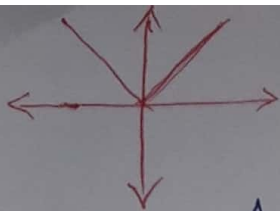
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ب) $y = \frac{2x+1}{x^2+1}$ $\rightarrow f(x) = \mathbb{R}$ ✓

ج) $y = \frac{\sqrt{x-2}}{x-4}$ $\rightarrow f(x) = \mathbb{R} - [4]$

د) $y = \frac{2x+5}{|x|+x^2}$ $\rightarrow f(x) = \mathbb{R} - [0]$ ✓

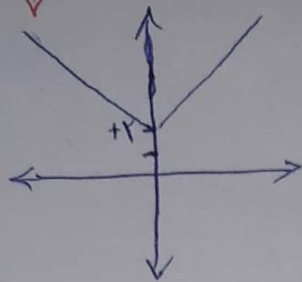
$$y = |x|$$



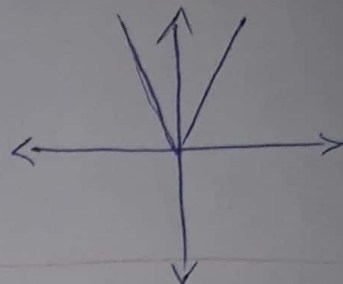
سوال ۳:

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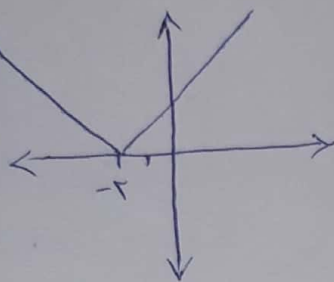
الف) $y = |x| + 2$



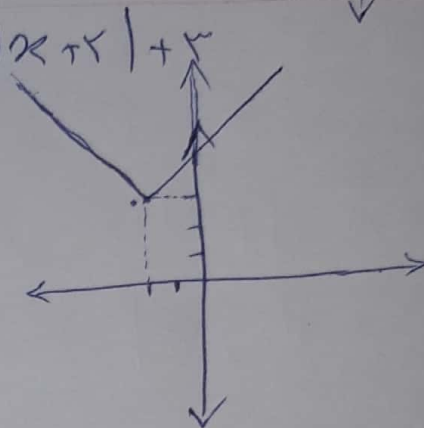
ب) $y = 2|x|$



ج) $y = |x+2|$

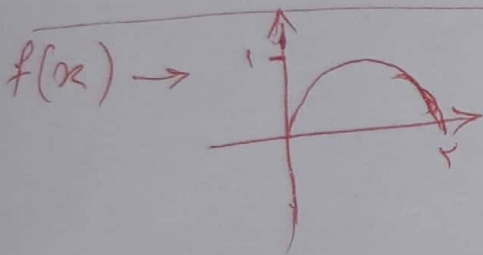


د) $y = |x+2| + 2$

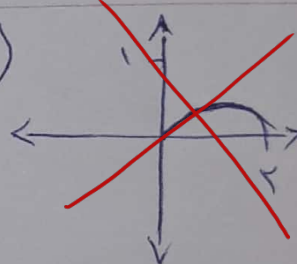


سوال ۵:

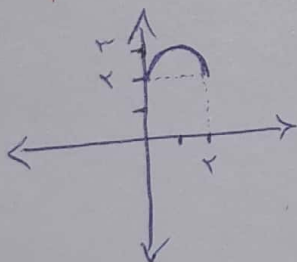
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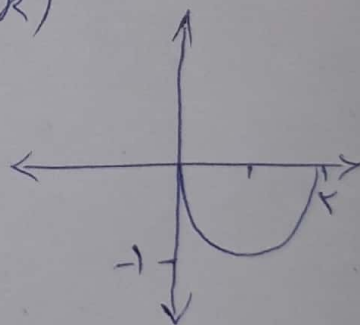
ب) $2f(x)$



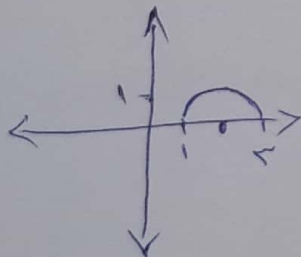
الف) $f(x) + 2$



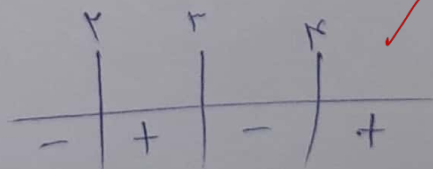
د) $-f(x)$



ج) $f(x-1)$



الف) $y = (x-2)(x-3)(x-4)$

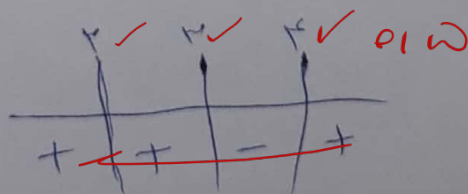


سوال ۶:

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$x = \{2, 3, 4\}$

ب) $y = (x-2)(x-3)^2(x-4)$



$x = \{2, 3, 4\}$

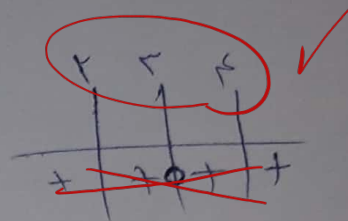
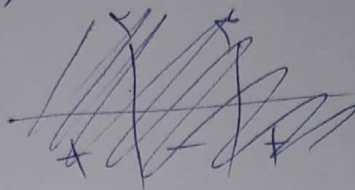
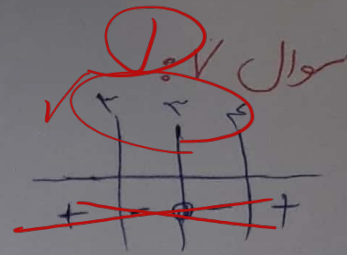
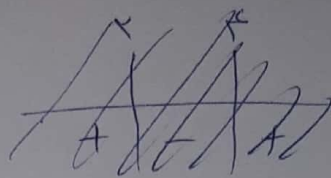
الف) ~~$y = \frac{x^3 - 5x^2 + 4x}{x^2 - 2x - 3}$~~

الف) $y = \frac{(x-2)(x-4)}{x-3}$

~~$x = \{2, 3, 4\}$~~

الف) $y = \frac{(x-2)(x-4)}{(x-3)^2}$

~~$x = \{2, 3, 4\}$~~



سوال ٨ :

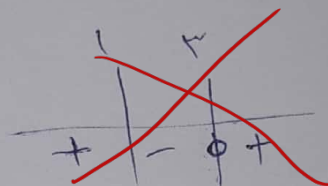
~~$y = \frac{x^3 - 2x^2 + x}{x^2 + 2x + 2}$~~

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

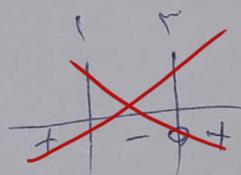
$x = \{1, 2\}$

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

$x = \{2, 1\}$



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

$x = \{0, 1, -1\}$

الف) $y = \frac{x^2 + 2x + 1}{x^2 + 2x + 2}$



سوال ٩ :

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$f(x) = \mathbb{R}$

الف) ~~$y = \sqrt{\frac{x^2 - 1}{x^2 - x}}$~~

$f(x) = (-\infty, 1]$

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

$f(x) = \mathbb{R} - [1]$

سوال ١٠ :

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