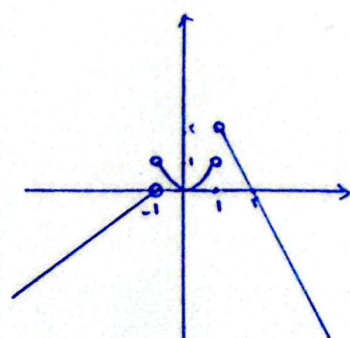
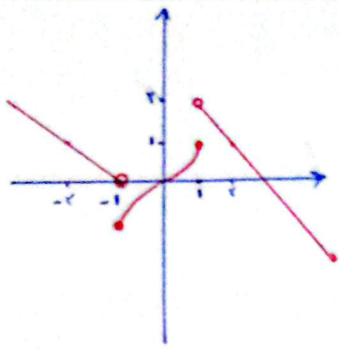


الف) $y' = 2x^2 - 1$ $y_1' = 2x_1^2 - 1$ $y_2' = 2x_2^2 - 1$ $x_1 = x_2 \rightarrow y_1' = y_2'$ $\Rightarrow y_1 = y_2$ تابع است.	ب) $y' + y = 3x^2 - 1$ $y_1' + y_1 = 3x_1^2 - 1$ $y_2' + y_2 = 3x_2^2 - 1$ $x_1 = x_2 \rightarrow y_1' + y_1 = y_2' + y_2$ $y_1' - y_2' = y_2 - y_1$ $(y_1 - y_2)(y_1' + y_1 + y_2' + y_2) = -(y_1 - y_2)$ $\Rightarrow (y_1 - y_2)(y_1 + y_2 + y_1' + y_2') = 0$ ① $y_1 = y_2$ ✓ ② $y_1 + y_2 + y_1' + y_2' = 0$ تابع نیست.	۱
الف) $y = x^2 - 1$ $y_1 = x_1^2 - 1$ $y_2 = x_2^2 - 1$ $x_1 = x_2 \rightarrow y_1 = y_2$ ✓ تابع است. ج) $y' + x^2 = 2x - 1 \Rightarrow y' = -x^2 + 2x - 1$ $y' = \text{cloud}$ تابع است.	ب) $y + xy = x^2 + 1$ $y(x \pm 1) = x^2 + 1 \rightarrow \frac{y}{y} = \frac{x^2 + 1}{x \pm 1} \Rightarrow y = \frac{x^2 + 1}{x \pm 1}$ تابع نیست. د) $\sqrt[3]{y} + \sqrt[3]{x} = x \Rightarrow \sqrt[3]{y} = x - \sqrt[3]{x}$ $\Rightarrow \sqrt[3]{y} = \text{cloud}$ تابع است.	۲
الف) $\tan \frac{\pi}{4} = \frac{\sin \frac{\pi}{4}}{\cos \frac{\pi}{4}} = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{\sqrt{2}}} = \sqrt{2}$ ج) $\tan \pi = \frac{\sin \pi}{\cos \pi} = \frac{0}{-1} = 0$	ب) $\cos \frac{\sqrt{2}\pi}{4} = \frac{\cos \frac{\sqrt{2}\pi}{4}}{\sin \frac{\sqrt{2}\pi}{4}} = \frac{-\frac{\sqrt{2}}{2}}{-\frac{1}{\sqrt{2}}} = \sqrt{2}$ د) $\cos \pi = \frac{\cos \pi}{\sin \pi} = \frac{-1}{0}$ تعریف نشده.	۳
الف) $\sin \alpha = \frac{1}{2} \Rightarrow \alpha = \frac{\pi}{6}, \frac{5\pi}{6}$ ب) $\cos \alpha = \frac{\sqrt{2}}{2} \Rightarrow \alpha = \frac{\pi}{4}, \frac{7\pi}{4}$		۴
	$f(x) = \begin{cases} -2x + 4 & x > 1 \\ x^2 & -1 < x < 1 \\ x + 1 & x < -1 \end{cases}$	۵

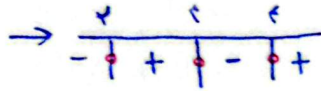


$$f(x) = \begin{cases} -x+5 & x > 1 \\ x^2 & -1 \leq x \leq 1 \\ -x-1 & x < -1 \end{cases}$$

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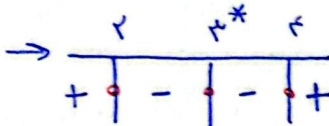
الف) $y = (x-2)(x-2)(x-4)$

$2, 2, 4$



ب) $y = (x-2)(x-2)^2(x-4)$

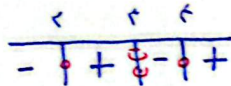
$2, 2^*, 4$



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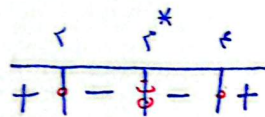
الف) $y = \frac{(x-2)(x-4)}{x-2}$

$2, 2, 4$



ب) $y = \frac{(x-2)(x-4)}{(x-2)^2}$

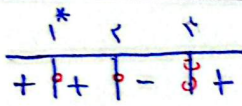
$2, 2^*, 4$



٨

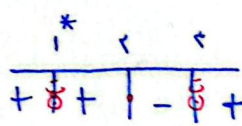
الف) $y = \frac{x^2 - 2x + 2}{x-2} = \frac{(x-1)(x-2)}{x-2}$

$1^*, 2, 2$



ب) $y = \frac{x^2 - 2x + 2}{x^2 - 2x + 2} = \frac{(x-1)(x-2)}{(x-1)(x-2)}$

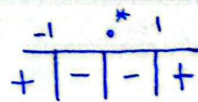
$1^*, 2, 2$



٩

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

همیشه مثبت



ب) $y = \frac{x^2 + 2x + 2}{x^2 + 2x + 2} \rightarrow$ همیشه برابر ۱

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