

۱۴، ۱۵

الف) $y^3 = x^2 - 1$

تابع است ✓

$$\begin{aligned} y_1^3 &= x_1^2 - 1 \\ y_2^3 &= x_2^2 - 1 \end{aligned} \quad \left. \begin{array}{l} x=4 \\ x=4 \end{array} \right\} \begin{array}{l} y_1^3 + 1 = y_2^3 + 1 \\ y_1^3 - y_2^3 = 0 \rightarrow y_1^3 = y_2^3 \\ y_1 = y_2 \end{array}$$

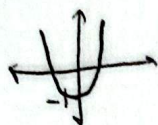
Ⓜ ✓

ب) $y^3 + y = x^2 - 1$ ✓ تابع است

$$\begin{aligned} y_1^3 + y_1 &= x_1^2 - 1 \\ y_2^3 + y_2 &= x_2^2 - 1 \end{aligned} \quad \left. \begin{array}{l} x=4 \\ x=4 \end{array} \right\} \begin{array}{l} y_1^3 + y_1 = y_2^3 + y_2 \\ y_1^3 - y_2^3 + y_1 - y_2 = 0 \rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + (y_1 - y_2) = 0 \\ (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0 \rightarrow y_1 - y_2 = 0 \end{array}$$

الف) $y = x^2 - 1$

$y = x^2 \rightarrow$



تابع است ✓

تابع زوج

ب) $|y| + xy = x^2 + 1$

$x=0 \rightarrow |y| = 2 \rightarrow y = \pm 2$ تابع نیست

ج) $y^3 + x^2 = x^2 + 1$ ✓
 $x=1 \rightarrow y^3 + 1 = 1 + 1 \rightarrow y^3 = 0 \rightarrow y = 0$ تابع است

د) $\sqrt[3]{y} + \sqrt{x} = 2$ ✓
 $x=0 \rightarrow \sqrt[3]{y} = 2 \rightarrow y = 8$

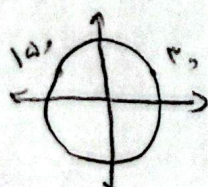
الف) $\tan \frac{\pi}{4} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$ Ⓜ ✓

ب) الف) $\frac{\sqrt{3}}{4} = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \frac{\sqrt{3} \times 2}{-\sqrt{3} \times 1} = -1$ Ⓜ

ج) $\tan 30^\circ = \frac{-\frac{1}{\sqrt{3}}}{\frac{\sqrt{3}}{2}} = \frac{(-1)}{\sqrt{3} \times 2} = -\frac{1}{2\sqrt{3}}$ Ⓜ

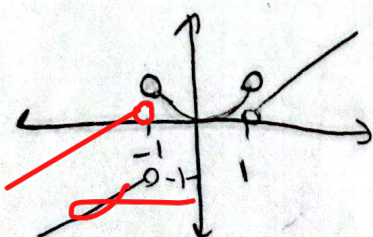
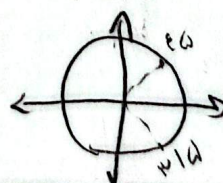
د) $\cot 180^\circ = -\frac{1}{0} = \text{Ⓜ}$

الف) $\sin \alpha = \frac{1}{2} \rightarrow 30^\circ, 150^\circ$
 $\angle \frac{\pi}{6}, \frac{5\pi}{6}$



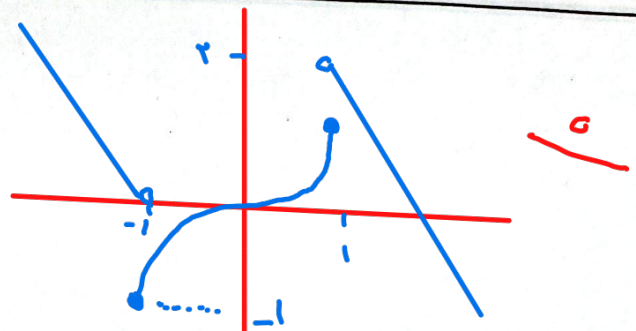
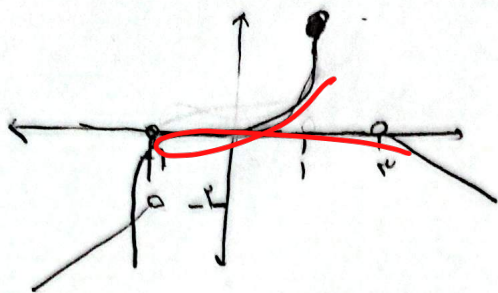
Ⓜ ✓

ب) $\cos \alpha = \frac{\sqrt{2}}{2} \rightarrow 45^\circ, 135^\circ$
 $\angle \frac{\pi}{4}, \frac{3\pi}{4}$

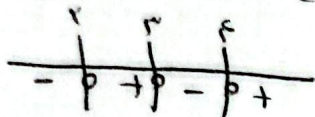


۱، ۵

✓

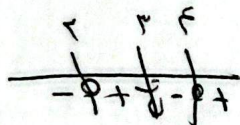


الف) $y = (x-2)(x-3)(x-4)$



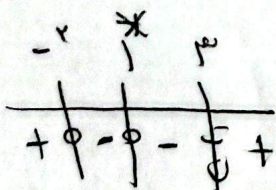
Ⓢ ✓

ب) $y = \frac{(x-2)(x-4)}{x-3}$



Ⓢ ✓

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

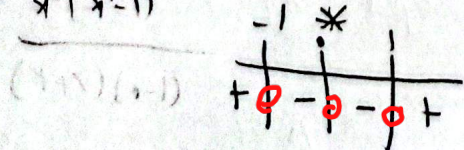


1/0

د) $y = \frac{x^2 - x}{x^2 + x + 2}$

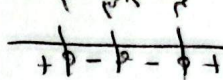
$(x-1)(x) \rightarrow \Delta$ منفي

$x^2(x^2+2x+1)$

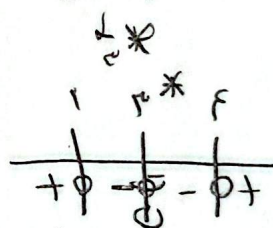


1/0

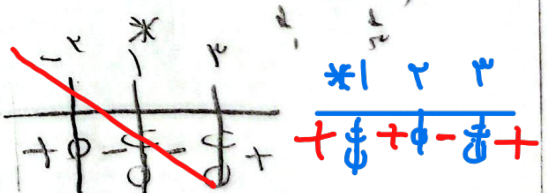
هـ) $y = (x-2)(x-3)(x-4)$



و) $y = \frac{(x-2)(x-4)}{(x-3)^2}$



ز) $\frac{x^2 - 3x + 2}{x^2 - 6x + 9} = \frac{(x-1)(x-2)}{(x-3)^2}$



ح) $\frac{x^2 + 3x + 2}{x^2 + 2x + 2} \rightarrow \Delta$ منفي

$x^2 + 2x + 2 \rightarrow$ منفي

$(x+1)(x+2)$

المستقيم

10

رابطه تابع است و نباید مثال نقض بونی

۲- ج

$$y^3 + x^3 = 2x - 1$$

$$y_1^3 + x_1^3 = 2x_1 - 1$$

$$y_2^3 + x_2^3 = 2x_2 - 1$$

$$\xrightarrow{x_1 = x_2} y_1^3 = y_2^3 \rightarrow y_1 = y_2$$

تابع است

رابطه تابع است و نباید مثال نقض بونی:

د

$$\sqrt[3]{y} + \sqrt[3]{x} = 1$$

تعریف ریاضی

$$\sqrt[3]{y_1} + \sqrt[3]{x_1} = 1$$

$$\sqrt[3]{y_2} + \sqrt[3]{x_2} = 1$$

$$\xrightarrow{x_1 = x_2 = x} \sqrt[3]{y_1} + \sqrt[3]{x} = 1 \quad \sqrt[3]{y_2} + \sqrt[3]{x} = 1 \rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2$$