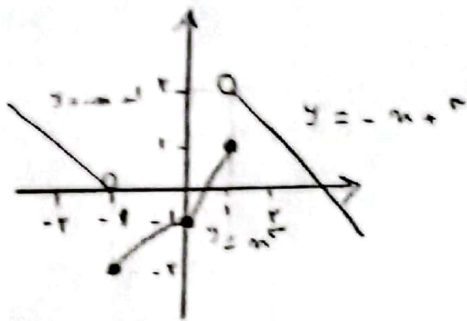


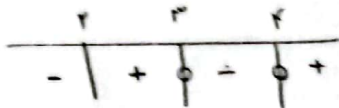
الف) $y^3 = 3x^2 - 1$ $x=0 \Rightarrow y^3 = -1$ $y = (-1)$ تابع است	ب) $y^3 + y = 3x^2 - 1$ $y_1^3 + y_1 = 3x_1^2 - 1$ $y_2^3 + y_2 = 3x_2^2 - 1$ $y_1^3 - y_2^3 + y_1 - y_2 = 0$ $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0$ $y_1 - y_2 = 0 \Rightarrow y_1 = y_2$ $y_1^2 + y_1 y_2 + y_2^2 + 1 = 0 \Rightarrow y_1 = \frac{-y_2 \pm \sqrt{5}}{2}$	الف) $y = x^2 - 1$ $x=0$ $y = -1$ $y^5 = (-1)$ $y^5 = (-1)$ تابع نیست چون	ب) $y + xy = x^2 + 1$ $x=0$ $y + 0 = 0 + 1$ $y = 1$ $y = \pm 1$ تابع نیست	ج) $y^3 + x^3 = 2x - 1$ $x=0$ $y^3 + 0 = 0 - 1$ $y^3 = -1$ $y = -1$ تابع است	د) $\sqrt[3]{y} + \sqrt[3]{x} = 2$ $x=0$ $\sqrt[3]{y} = 2$ $y = 8$ تابع است	الف) $\tan \frac{\pi}{3}$ $\frac{\sin \frac{\pi}{3}}{\cos \frac{\pi}{3}} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$	ب) $\cot \frac{\sqrt{n}}{4}$ $\frac{\cos \frac{\sqrt{n}}{4}}{\sin \frac{\sqrt{n}}{4}} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = +\sqrt{3}$	ج) $\tan 33^\circ$ $\frac{\sin 33^\circ}{\cos 33^\circ} \Rightarrow$ $\frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}}$	د) $\cot 18^\circ$ $\frac{\cos 18^\circ}{\sin 18^\circ} = \frac{1}{0}$ تعریف نشده	الف) $\sin \alpha = \frac{1}{4}$ زاویه های $30^\circ, 150^\circ \Rightarrow \frac{\pi}{4}, \frac{3\pi}{4}$	ب) $\cos \alpha = \frac{\sqrt{2}}{2}$ زاویه های $45^\circ, 135^\circ \Rightarrow \frac{\pi}{4}, \frac{3\pi}{4}$	
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6

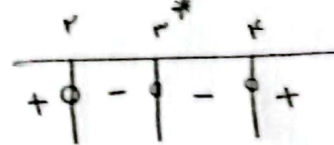
$$\text{a)} y = (x-r)(x-r)(x-r)$$

$$\begin{aligned} x &= r \\ x &= r \\ x &= r \end{aligned}$$



$$\text{b)} y = (x-r)(x-r)^r(x-r)$$

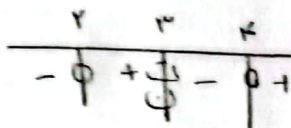
$$\begin{aligned} x &= r \\ x &= r^* \\ x &= r \end{aligned}$$



7

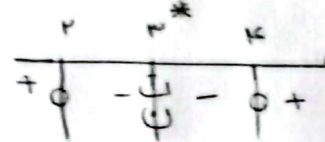
$$\text{a)} y = \frac{(x-r)(x-r)}{x-r}$$

$$\begin{aligned} x &= r \\ x &= r \\ x &= r \end{aligned}$$



$$\text{b)} y = \frac{(x-r)(x-r)}{(x-r)^r}$$

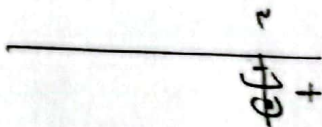
$$\begin{aligned} x &= r \\ x &= r^* \\ x &= r \end{aligned}$$



8

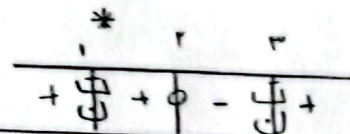
$$\text{a)} y = \frac{x^r - rx + r}{x-r}$$

$$x \neq r$$



$$\text{b)} y = \frac{x^r - rx + r}{x^r - rx + r}$$

$$\begin{aligned} x &= 1^* \\ x &= r \\ x &= r \end{aligned}$$

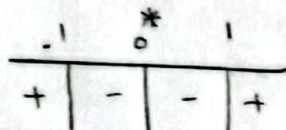


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$$\text{a)} y = \frac{x^r - x^r}{x^r + x + r} \rightarrow \Delta < 0$$

$$x^r(x^r - 1) = x^r(x-1)(x+1)$$

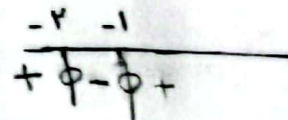
$$\begin{aligned} x &= 0^* \\ x &= 1 \\ x &= -1 \end{aligned}$$



$$\text{b)} y = \frac{x^r + rx + r}{x^r + rx + r} \Delta < 0$$

$$\frac{-r \pm \sqrt{9 \cdot r^2 + 4r}}{2r} = \frac{-r \pm 1}{r} = \frac{-r}{r} = -1$$

$$\frac{-r-1}{r} = \frac{-r}{r} = -1$$



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