

الف) $y_1 = -y_2 \pm \sqrt{3y_2 - 4}$ تابع است $\Rightarrow y = \sqrt[3]{x^2 - 1} \Rightarrow y^3 = x^2 - 1 \Rightarrow y^3 + 1 = x^2$

ب) $y_1^3 - y_2^3 + y_1 - y_2 = 0 \Rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 1) = 0 \Rightarrow y_1 = y_2$
 $\Rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 1) = 0 \Rightarrow y_1 = y_2$
 $\Rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 1) = 0 \Rightarrow y_1 = y_2$

تابع نیست $\Rightarrow y = (x-1)(x+1) \Rightarrow y = x^2 - 1 \Rightarrow y^3 = x^2 - 1$

ب) $|y| + xy = x^2 + 1 \Rightarrow |y| = x^2 - xy + 1 \Rightarrow y = \pm(x^2 - xy + 1)$ تابع نیست

تابع است $\Rightarrow y^3 = x^3 - 2x - 1 \Rightarrow y = \sqrt[3]{x^3 - 2x - 1}$

تابع است $\Rightarrow y = (2 - \sqrt{x})^3 \Rightarrow \sqrt[3]{y} + \sqrt{x} = 2 \Rightarrow \sqrt[3]{y} = 2 - \sqrt{x} \Rightarrow y = (2 - \sqrt{x})^3$

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) $\cot \frac{\pi}{4} = \frac{\cos \frac{\pi}{4}}{\sin \frac{\pi}{4}} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$

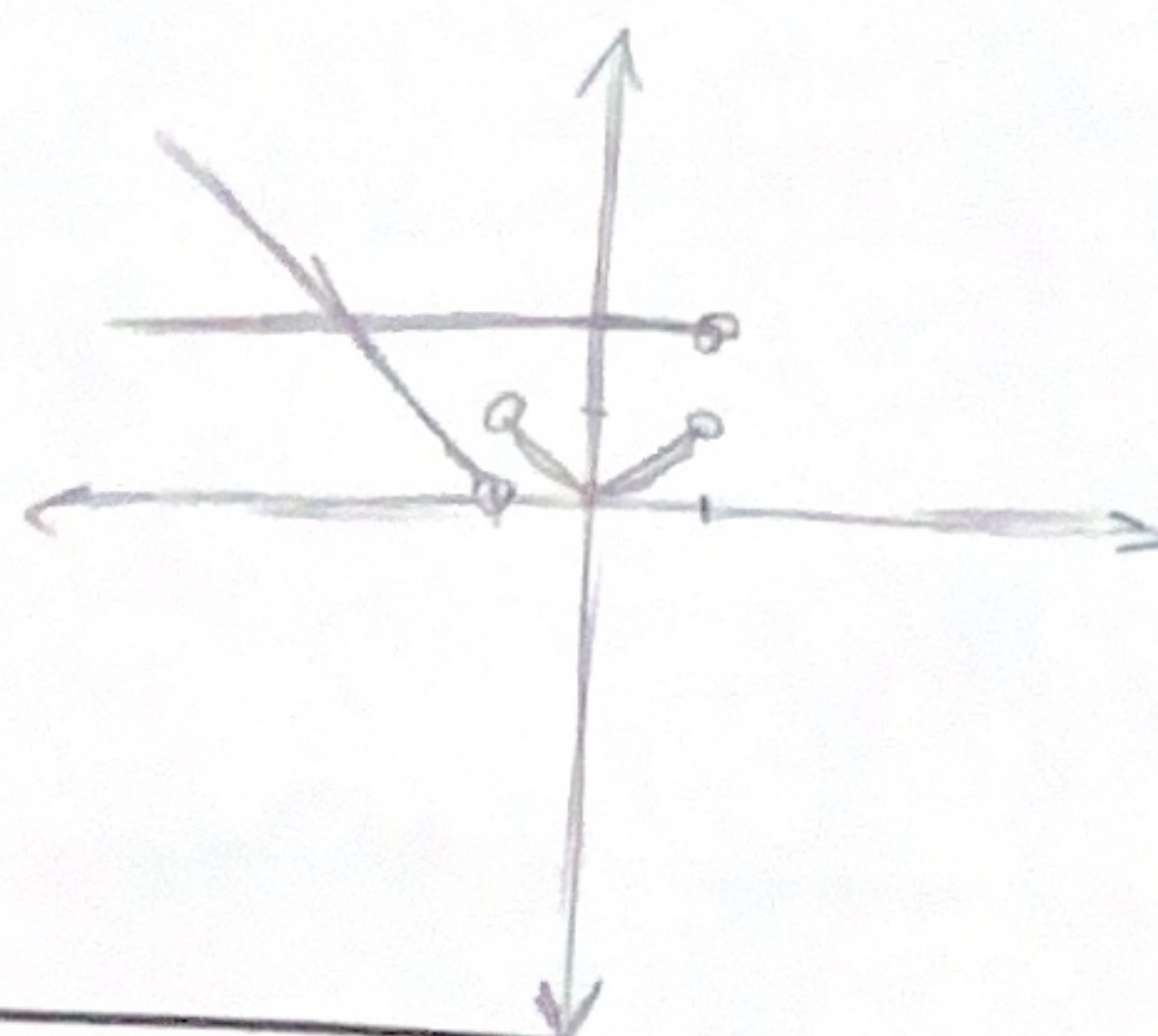
ج) $\tan 33^\circ = \frac{\sin 33^\circ}{\cos 33^\circ} = \frac{\frac{1}{\sqrt{3}}}{\frac{\sqrt{3}}{2}} = \frac{2}{3}$

د) $\cot 18^\circ = \frac{\cos 18^\circ}{\sin 18^\circ} = \frac{1}{0} \Rightarrow$ تعریف نشده

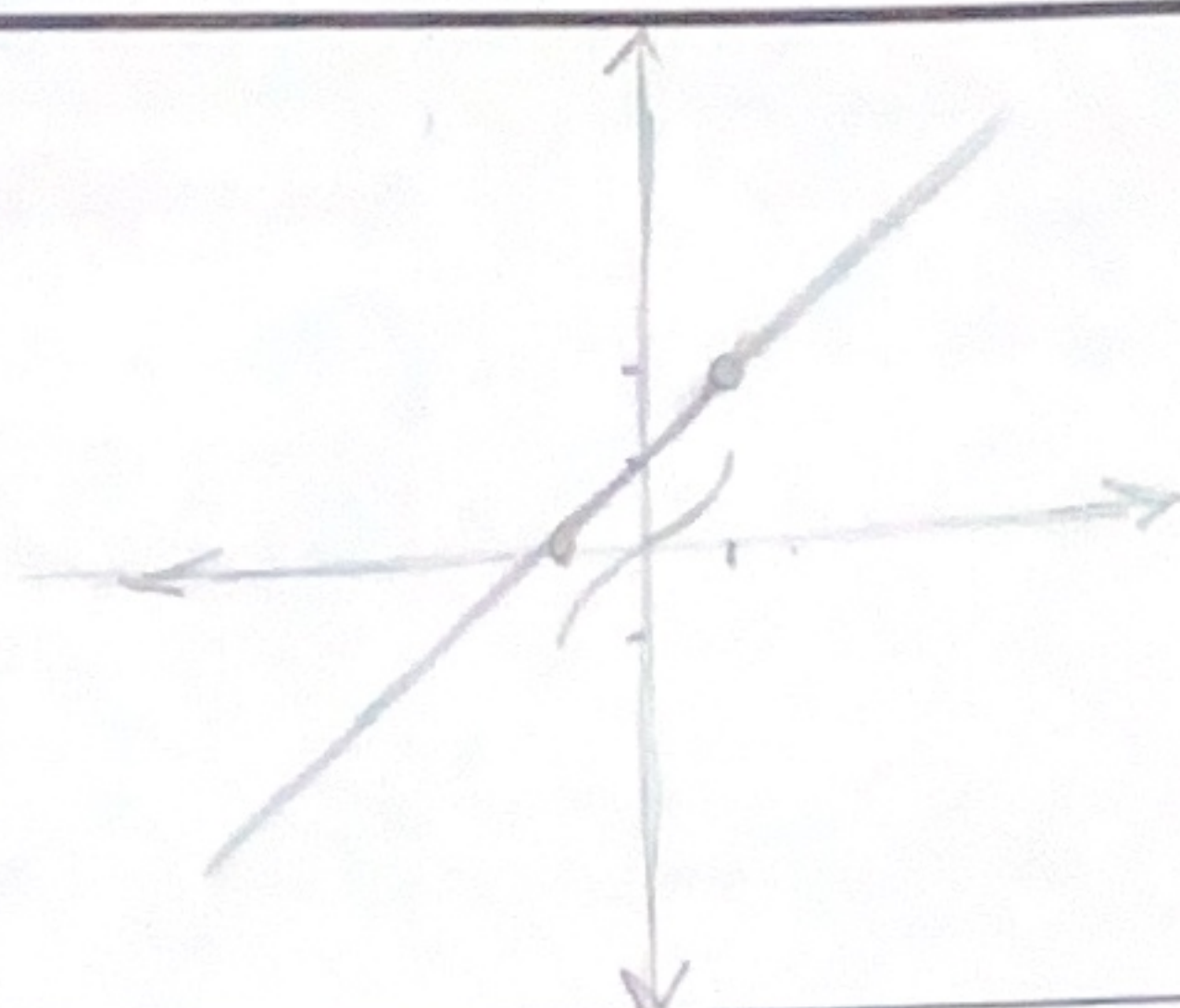
الف) $\sin \alpha = \frac{1}{4} \Rightarrow \alpha = 30^\circ, 150^\circ / \frac{\pi}{6}, \frac{5\pi}{6}$

ب) $\cos \alpha = \frac{\sqrt{2}}{4} \Rightarrow \alpha = 45^\circ, 315^\circ / \frac{\pi}{4}, \frac{7\pi}{4}$

$f(x) = \begin{cases} -2x+4 & x > 1 \\ x^2 & -1 < x < 1 \\ x+1 & x < -1 \end{cases}$



$$f(x) = \begin{cases} -x+3 & x > 1 \\ x^3 & -1 \leq x \leq 1 \\ -x-1 & x < -1 \end{cases}$$



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الف) $y = (x-2)(x-3)(x-4) \Rightarrow$

ب) $y = (x-2)(x-3)^2(x-4) \Rightarrow$

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الف) $\frac{(x-2)(x-4)}{(x-3)}$

ب) $\frac{(x-2)(x-4)}{(x-3)^2}$

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

ب) $\frac{x^2-3x+2}{x^2-4x+3} = \frac{(x-2)(x-1)}{(x-3)(x-1)} \Rightarrow$

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

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ب) $\frac{x^2+3x+2}{x^2+12x+20} = \frac{(x+2)(x+1)}{(x+10)(x+2)} \Rightarrow x \in \mathbb{R} \Rightarrow$