

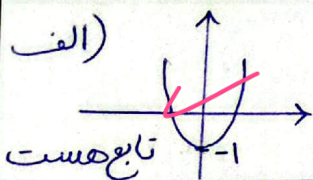
۱۹۵۰

الف) $y_1^3 = 2x_1^2 - 1$
 $y_2^3 = 2x_2^2 - 1$ } تابع هست
 $x_1 = x_2 \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2$

ب) $y_1^3 = 3x_1^2 - 1 - y_1$
 $y_2^3 = 3x_2^2 - 1 - y_2$

$x_1 = x_2 \rightarrow y_1^3 + y_1 = y_2^3 + y_2 \rightarrow y_1^3 + y_1 - y_2^3 - y_2 = 0$

$\rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0$
 $y_1 = y_2$ $\Delta = \text{همواره} + \text{منفی}$ تابع هست



ب) $|y| = x^2 - xy + 1 \Rightarrow y = \begin{cases} x^2 - xy + 1 \\ -(x^2 - xy + 1) \end{cases}$ تابع نیست

ج) $y_1^3 = -x_1^3 + 2x_1 - 1$
 $y_2^3 = -x_2^3 + 2x_2 - 1$ } تابع هست
 $x_1 = x_2 \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2$
 $\sqrt[3]{y_1} = -\sqrt[3]{x_1} + 2$
 $\sqrt[3]{y_2} = -\sqrt[3]{x_2} + 2 \rightarrow y_1 = y_2$

الف) $\rightarrow \frac{\sqrt{3}}{2} \cdot \frac{1}{\sqrt{3}} = \boxed{\sqrt{3}}$

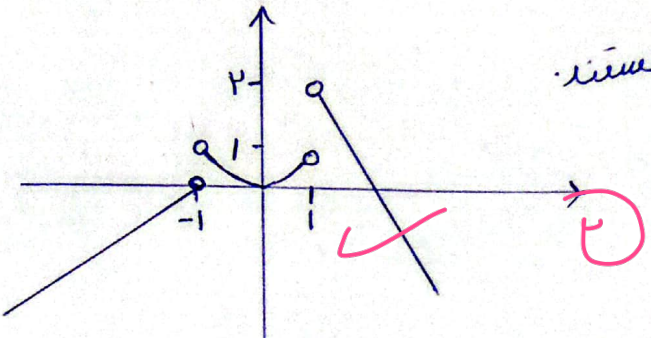
ج) $\frac{-1}{\sqrt{3}} \cdot \frac{1}{\sqrt{3}} = \boxed{\frac{-1}{\sqrt{3}}}$

ب) $\rightarrow \frac{-\sqrt{3}}{2} \cdot \frac{1}{\sqrt{3}} = \boxed{\sqrt{3}}$

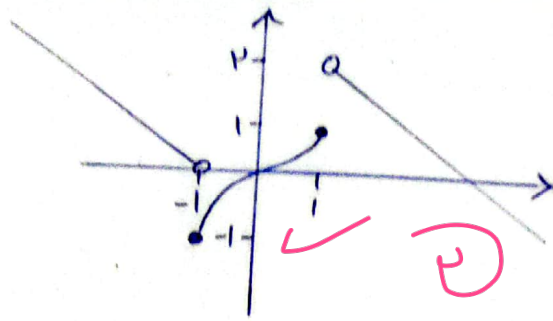
د) $\frac{4}{0} = \text{تعریف نشده}$

الف) $a = \frac{\pi}{6}, 5\frac{\pi}{6}$ 150°

ب) $a = \frac{\pi}{4}, 7\frac{\pi}{4}$ 315°

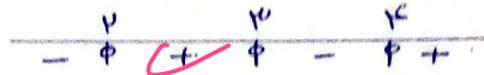


دایره ها تو خالی هستند



٦

الف) $y = (x-2)(x-3)(x-4)$

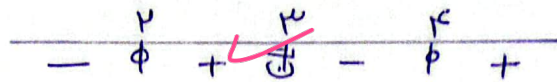


ب) $y = (x-2)(x-3)^2(x-4)$

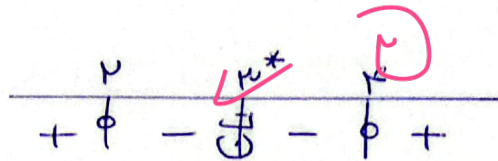


٧

الف) $y = \frac{(x-2)(x-4)}{x-3}$

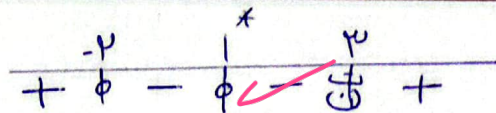


ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$

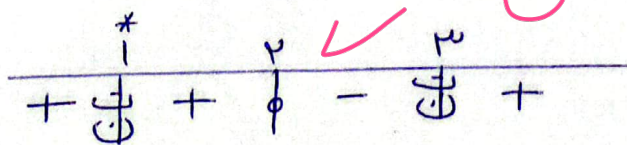


٨

الف) $\frac{(x-1)^2(x+2)}{x-3}$

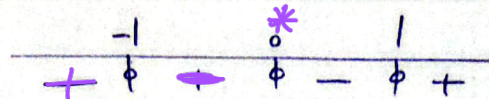


ب) $\frac{(x-1)(x-2)}{(x-3)(x-1)}$



٩

الف) $\frac{x^2(x-1)}{x^2+x+2}$



$\Delta = 1 - 1 = -1$

$x^2 = 0 \rightarrow x \times x = 0$ (مصفوفات)

١, ٢

ب) $y = \frac{x^2+3x+2}{x^2+2x+3}$

$\Delta = 9 - 12 = -3$

$\Delta = 4 - 12 = -8$

الف - ۱۰

$$y = \frac{n^4 - n^2}{n^2 + n + 2} = \frac{n^2(n^2 - 1)}{n^2 + n + 2} = \frac{n^2(n-1)(n+1)}{n^2 + n + 2}$$

صفرها ← $n^2(n-1)(n+1)$

صفرها: $n=0, n=1, n=-1$

علامه: $+$ $-$ $-$ $+$