

نام و نام خانوادگی شماره کلاس نام و نام خانوادگی شماره کلاس

$$1) \quad Y_1^3 = r \alpha_1^2 - 1$$

$$Y_2^3 = r \alpha_2^2 - 1$$

$$\text{if } \alpha_1 = \alpha_2$$

$$Y_1^3 = Y_2^3$$

$$\text{هم علامت}$$

$$Y_1 = Y_2$$

بجاست

$$Y_1^3 + Y_1 = r \alpha_1^2 - 1$$

$$Y_2^3 + Y_2 = r \alpha_2^2 - 1$$

$$\alpha_1 = \alpha_2$$

$$Y_1^3 + Y_1 = Y_2^3 + Y_2 \rightarrow Y_1^3 - Y_2^3 + Y_1 - Y_2 = 0$$

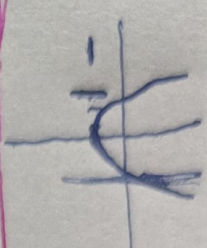
$$(Y_1 - Y_2)(Y_1^2 + Y_1 Y_2 + Y_2^2) + (Y_1 - Y_2) = 0 \rightarrow$$

$$\begin{cases} Y_1 - Y_2 = 0 \rightarrow Y_1 = Y_2 \\ Y_1^2 + Y_1 Y_2 + Y_2^2 + 1 = 0 \end{cases}$$

$$Y_1 = -Y_2 \pm \sqrt{Y_2^2 + Y_2 + 1}$$

دانشمندی است که به غیر صحتنا نمی‌پردازد

الف) خط عمود بر آری
را قطع می کند بی نهایت
است



ب) $|y| + (0 \times y) = 0^2 + 1$
تابع نیست
چون باز آری بی نهایت
مقدور داریم
 $|y| = 1$
 $y = \pm 1$

ج) $y_1^3 = y_2^3 - 1 - x_1^3$
 $y_2^3 = y_2^3 - 1 - x_2^3$

$x_1 = x_2$

$y_1^3 = y_2^3$

$y_1 = y_2$

برای هر دو یکنواختی داریم بی نهایت

$\sqrt[3]{y_1} + \sqrt[3]{x_1} = 2$
 $\sqrt[3]{y_2} + \sqrt[3]{x_2} = 2$

$x_1 = x_2$

$\sqrt[3]{y_1} = \sqrt[3]{y_2}$

$y_1 = y_2$

تابع است چون بی نهایت یکنواختی داریم

تعريف ١٨٥ = $\frac{1}{0}$ د

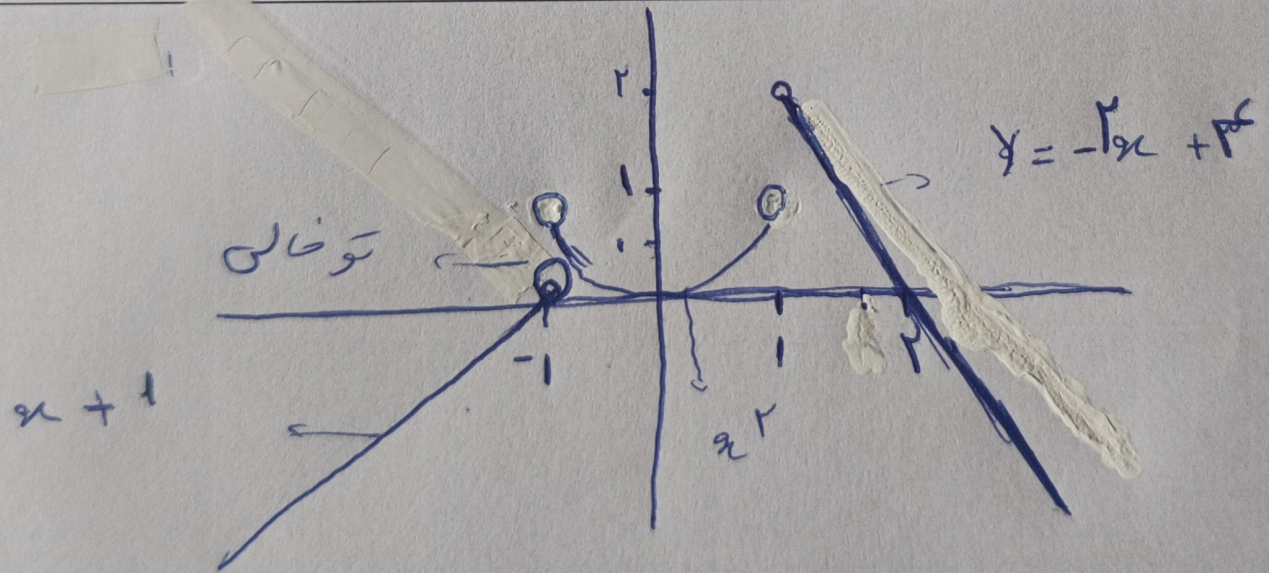
$$1) \tan \frac{\pi}{2} = \frac{\sin \frac{\pi}{2}}{\cos \frac{\pi}{2}} = \frac{\sqrt{2}}{\frac{1}{2}} = \sqrt{2}$$

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

$$3) \tan \frac{\pi}{4} = \frac{\sin \frac{\pi}{4}}{\cos \frac{\pi}{4}} = \frac{\frac{1}{2}}{\frac{1}{2}} = 1$$

$$\text{الف) } \sin a = \frac{1}{r} \rightarrow a = \frac{\pi}{4}, \text{ و } \frac{3\pi}{4}$$

$$\text{ب) } \cos a = \frac{\sqrt{2}}{r} \rightarrow a = \frac{\pi}{4}, \frac{3\pi}{4}$$



معادلات ۱ و ۲: $x_1 = x_2$ $y_1 = y_2$ $z_1 = z_2$ $w_1 = w_2$ $v_1 = v_2$ $u_1 = u_2$ $t_1 = t_2$ $s_1 = s_2$ $r_1 = r_2$ $q_1 = q_2$ $p_1 = p_2$ $o_1 = o_2$ $n_1 = n_2$ $m_1 = m_2$ $l_1 = l_2$ $k_1 = k_2$ $j_1 = j_2$ $i_1 = i_2$ $h_1 = h_2$ $g_1 = g_2$ $f_1 = f_2$ $e_1 = e_2$ $d_1 = d_2$ $c_1 = c_2$ $b_1 = b_2$ $a_1 = a_2$ $z_1 = z_2$ $y_1 = y_2$ $x_1 = x_2$ $w_1 = w_2$ $v_1 = v_2$ $u_1 = u_2$ $t_1 = t_2$ $s_1 = s_2$ $r_1 = r_2$ $q_1 = q_2$ $p_1 = p_2$ $o_1 = o_2$ $n_1 = n_2$ $m_1 = m_2$ $l_1 = l_2$ $k_1 = k_2$ $j_1 = j_2$ $i_1 = i_2$ $h_1 = h_2$ $g_1 = g_2$ $f_1 = f_2$ $e_1 = e_2$ $d_1 = d_2$ $c_1 = c_2$ $b_1 = b_2$ $a_1 = a_2$

۱) $x_1^3 = x_2^3 - 1$ $y_1^3 = y_2^3 - 1$ $z_1^3 = z_2^3 - 1$ $w_1^3 = w_2^3 - 1$ $v_1^3 = v_2^3 - 1$ $u_1^3 = u_2^3 - 1$ $t_1^3 = t_2^3 - 1$ $s_1^3 = s_2^3 - 1$ $r_1^3 = r_2^3 - 1$ $q_1^3 = q_2^3 - 1$ $p_1^3 = p_2^3 - 1$ $o_1^3 = o_2^3 - 1$ $n_1^3 = n_2^3 - 1$ $m_1^3 = m_2^3 - 1$ $l_1^3 = l_2^3 - 1$ $k_1^3 = k_2^3 - 1$ $j_1^3 = j_2^3 - 1$ $i_1^3 = i_2^3 - 1$ $h_1^3 = h_2^3 - 1$ $g_1^3 = g_2^3 - 1$ $f_1^3 = f_2^3 - 1$ $e_1^3 = e_2^3 - 1$ $d_1^3 = d_2^3 - 1$ $c_1^3 = c_2^3 - 1$ $b_1^3 = b_2^3 - 1$ $a_1^3 = a_2^3 - 1$

۲) $x_1^3 + y_1^3 = x_2^3 + y_2^3 - 1$ $z_1^3 + w_1^3 = z_2^3 + w_2^3 - 1$ $v_1^3 + u_1^3 = v_2^3 + u_2^3 - 1$ $t_1^3 + s_1^3 = t_2^3 + s_2^3 - 1$ $r_1^3 + q_1^3 = r_2^3 + q_2^3 - 1$ $p_1^3 + o_1^3 = p_2^3 + o_2^3 - 1$ $n_1^3 + m_1^3 = n_2^3 + m_2^3 - 1$ $l_1^3 + k_1^3 = l_2^3 + k_2^3 - 1$ $j_1^3 + i_1^3 = j_2^3 + i_2^3 - 1$ $h_1^3 + g_1^3 = h_2^3 + g_2^3 - 1$ $f_1^3 + e_1^3 = f_2^3 + e_2^3 - 1$ $d_1^3 + c_1^3 = d_2^3 + c_2^3 - 1$ $b_1^3 + a_1^3 = b_2^3 + a_2^3 - 1$

۳) $x_1^3 + y_1^3 = x_2^3 + y_2^3 - 1$ $z_1^3 + w_1^3 = z_2^3 + w_2^3 - 1$ $v_1^3 + u_1^3 = v_2^3 + u_2^3 - 1$ $t_1^3 + s_1^3 = t_2^3 + s_2^3 - 1$ $r_1^3 + q_1^3 = r_2^3 + q_2^3 - 1$ $p_1^3 + o_1^3 = p_2^3 + o_2^3 - 1$ $n_1^3 + m_1^3 = n_2^3 + m_2^3 - 1$ $l_1^3 + k_1^3 = l_2^3 + k_2^3 - 1$ $j_1^3 + i_1^3 = j_2^3 + i_2^3 - 1$ $h_1^3 + g_1^3 = h_2^3 + g_2^3 - 1$ $f_1^3 + e_1^3 = f_2^3 + e_2^3 - 1$ $d_1^3 + c_1^3 = d_2^3 + c_2^3 - 1$ $b_1^3 + a_1^3 = b_2^3 + a_2^3 - 1$

۴) $(x_1 - y_1)(x_1^2 + x_1 y_1 + y_1^2 + 1) = 0$ $(z_1 - w_1)(z_1^2 + z_1 w_1 + w_1^2 + 1) = 0$ $(v_1 - u_1)(v_1^2 + v_1 u_1 + u_1^2 + 1) = 0$ $(t_1 - s_1)(t_1^2 + t_1 s_1 + s_1^2 + 1) = 0$ $(r_1 - q_1)(r_1^2 + r_1 q_1 + q_1^2 + 1) = 0$ $(p_1 - o_1)(p_1^2 + p_1 o_1 + o_1^2 + 1) = 0$ $(n_1 - m_1)(n_1^2 + n_1 m_1 + m_1^2 + 1) = 0$ $(l_1 - k_1)(l_1^2 + l_1 k_1 + k_1^2 + 1) = 0$ $(j_1 - i_1)(j_1^2 + j_1 i_1 + i_1^2 + 1) = 0$ $(h_1 - g_1)(h_1^2 + h_1 g_1 + g_1^2 + 1) = 0$ $(f_1 - e_1)(f_1^2 + f_1 e_1 + e_1^2 + 1) = 0$ $(d_1 - c_1)(d_1^2 + d_1 c_1 + c_1^2 + 1) = 0$ $(b_1 - a_1)(b_1^2 + b_1 a_1 + a_1^2 + 1) = 0$

۵) $x_1^3 = x_2^3 - 1$ $y_1^3 = y_2^3 - 1$ $z_1^3 = z_2^3 - 1$ $w_1^3 = w_2^3 - 1$ $v_1^3 = v_2^3 - 1$ $u_1^3 = u_2^3 - 1$ $t_1^3 = t_2^3 - 1$ $s_1^3 = s_2^3 - 1$ $r_1^3 = r_2^3 - 1$ $q_1^3 = q_2^3 - 1$ $p_1^3 = p_2^3 - 1$ $o_1^3 = o_2^3 - 1$ $n_1^3 = n_2^3 - 1$ $m_1^3 = m_2^3 - 1$ $l_1^3 = l_2^3 - 1$ $k_1^3 = k_2^3 - 1$ $j_1^3 = j_2^3 - 1$ $i_1^3 = i_2^3 - 1$ $h_1^3 = h_2^3 - 1$ $g_1^3 = g_2^3 - 1$ $f_1^3 = f_2^3 - 1$ $e_1^3 = e_2^3 - 1$ $d_1^3 = d_2^3 - 1$ $c_1^3 = c_2^3 - 1$ $b_1^3 = b_2^3 - 1$ $a_1^3 = a_2^3 - 1$

۶) $x_1^3 - y_1^3 = 0 \rightarrow x_1 = y_1$ $y_1^3 + y_1^2 + y_1 + 1 = 0 \rightarrow y_1 = -1$ $z_1^3 - w_1^3 = 0 \rightarrow z_1 = w_1$ $w_1^3 + w_1^2 + w_1 + 1 = 0 \rightarrow w_1 = -1$ $v_1^3 - u_1^3 = 0 \rightarrow v_1 = u_1$ $u_1^3 + u_1^2 + u_1 + 1 = 0 \rightarrow u_1 = -1$ $t_1^3 - s_1^3 = 0 \rightarrow t_1 = s_1$ $s_1^3 + s_1^2 + s_1 + 1 = 0 \rightarrow s_1 = -1$ $r_1^3 - q_1^3 = 0 \rightarrow r_1 = q_1$ $q_1^3 + q_1^2 + q_1 + 1 = 0 \rightarrow q_1 = -1$ $p_1^3 - o_1^3 = 0 \rightarrow p_1 = o_1$ $o_1^3 + o_1^2 + o_1 + 1 = 0 \rightarrow o_1 = -1$ $n_1^3 - m_1^3 = 0 \rightarrow n_1 = m_1$ $m_1^3 + m_1^2 + m_1 + 1 = 0 \rightarrow m_1 = -1$ $l_1^3 - k_1^3 = 0 \rightarrow l_1 = k_1$ $k_1^3 + k_1^2 + k_1 + 1 = 0 \rightarrow k_1 = -1$ $j_1^3 - i_1^3 = 0 \rightarrow j_1 = i_1$ $i_1^3 + i_1^2 + i_1 + 1 = 0 \rightarrow i_1 = -1$ $h_1^3 - g_1^3 = 0 \rightarrow h_1 = g_1$ $g_1^3 + g_1^2 + g_1 + 1 = 0 \rightarrow g_1 = -1$ $f_1^3 - e_1^3 = 0 \rightarrow f_1 = e_1$ $e_1^3 + e_1^2 + e_1 + 1 = 0 \rightarrow e_1 = -1$ $d_1^3 - c_1^3 = 0 \rightarrow d_1 = c_1$ $c_1^3 + c_1^2 + c_1 + 1 = 0 \rightarrow c_1 = -1$ $b_1^3 - a_1^3 = 0 \rightarrow b_1 = a_1$ $a_1^3 + a_1^2 + a_1 + 1 = 0 \rightarrow a_1 = -1$

۷) $x_1^3 - y_1^3 = 0 \rightarrow x_1 = y_1$ $y_1^3 + y_1^2 + y_1 + 1 = 0 \rightarrow y_1 = -1$ $z_1^3 - w_1^3 = 0 \rightarrow z_1 = w_1$ $w_1^3 + w_1^2 + w_1 + 1 = 0 \rightarrow w_1 = -1$ $v_1^3 - u_1^3 = 0 \rightarrow v_1 = u_1$ $u_1^3 + u_1^2 + u_1 + 1 = 0 \rightarrow u_1 = -1$ $t_1^3 - s_1^3 = 0 \rightarrow t_1 = s_1$ $s_1^3 + s_1^2 + s_1 + 1 = 0 \rightarrow s_1 = -1$ $r_1^3 - q_1^3 = 0 \rightarrow r_1 = q_1$ $q_1^3 + q_1^2 + q_1 + 1 = 0 \rightarrow q_1 = -1$ $p_1^3 - o_1^3 = 0 \rightarrow p_1 = o_1$ $o_1^3 + o_1^2 + o_1 + 1 = 0 \rightarrow o_1 = -1$ $n_1^3 - m_1^3 = 0 \rightarrow n_1 = m_1$ $m_1^3 + m_1^2 + m_1 + 1 = 0 \rightarrow m_1 = -1$ $l_1^3 - k_1^3 = 0 \rightarrow l_1 = k_1$ $k_1^3 + k_1^2 + k_1 + 1 = 0 \rightarrow k_1 = -1$ $j_1^3 - i_1^3 = 0 \rightarrow j_1 = i_1$ $i_1^3 + i_1^2 + i_1 + 1 = 0 \rightarrow i_1 = -1$ $h_1^3 - g_1^3 = 0 \rightarrow h_1 = g_1$ $g_1^3 + g_1^2 + g_1 + 1 = 0 \rightarrow g_1 = -1$ $f_1^3 - e_1^3 = 0 \rightarrow f_1 = e_1$ $e_1^3 + e_1^2 + e_1 + 1 = 0 \rightarrow e_1 = -1$ $d_1^3 - c_1^3 = 0 \rightarrow d_1 = c_1$ $c_1^3 + c_1^2 + c_1 + 1 = 0 \rightarrow c_1 = -1$ $b_1^3 - a_1^3 = 0 \rightarrow b_1 = a_1$ $a_1^3 + a_1^2 + a_1 + 1 = 0 \rightarrow a_1 = -1$

۸) $|x_1 + y_1| = 0^2 + 1$ $|z_1 + w_1| = 0^2 + 1$ $|v_1 + u_1| = 0^2 + 1$ $|t_1 + s_1| = 0^2 + 1$ $|r_1 + q_1| = 0^2 + 1$ $|p_1 + o_1| = 0^2 + 1$ $|n_1 + m_1| = 0^2 + 1$ $|l_1 + k_1| = 0^2 + 1$ $|j_1 + i_1| = 0^2 + 1$ $|h_1 + g_1| = 0^2 + 1$ $|f_1 + e_1| = 0^2 + 1$ $|d_1 + c_1| = 0^2 + 1$ $|b_1 + a_1| = 0^2 + 1$

۹) $|x_1| = 1$ $|y_1| = 1$ $|z_1| = 1$ $|w_1| = 1$ $|v_1| = 1$ $|u_1| = 1$ $|t_1| = 1$ $|s_1| = 1$ $|r_1| = 1$ $|q_1| = 1$ $|p_1| = 1$ $|o_1| = 1$ $|n_1| = 1$ $|m_1| = 1$ $|l_1| = 1$ $|k_1| = 1$ $|j_1| = 1$ $|i_1| = 1$ $|h_1| = 1$ $|g_1| = 1$ $|f_1| = 1$ $|e_1| = 1$ $|d_1| = 1$ $|c_1| = 1$ $|b_1| = 1$ $|a_1| = 1$

۱۰) $x = \pm 1$ $y = \pm 1$ $z = \pm 1$ $w = \pm 1$ $v = \pm 1$ $u = \pm 1$ $t = \pm 1$ $s = \pm 1$ $r = \pm 1$ $q = \pm 1$ $p = \pm 1$ $o = \pm 1$ $n = \pm 1$ $m = \pm 1$ $l = \pm 1$ $k = \pm 1$ $j = \pm 1$ $i = \pm 1$ $h = \pm 1$ $g = \pm 1$ $f = \pm 1$ $e = \pm 1$ $d = \pm 1$ $c = \pm 1$ $b = \pm 1$ $a = \pm 1$

۱۱) $\tan \frac{\pi}{3} = \frac{\sin \frac{\pi}{3}}{\cos \frac{\pi}{3}} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$

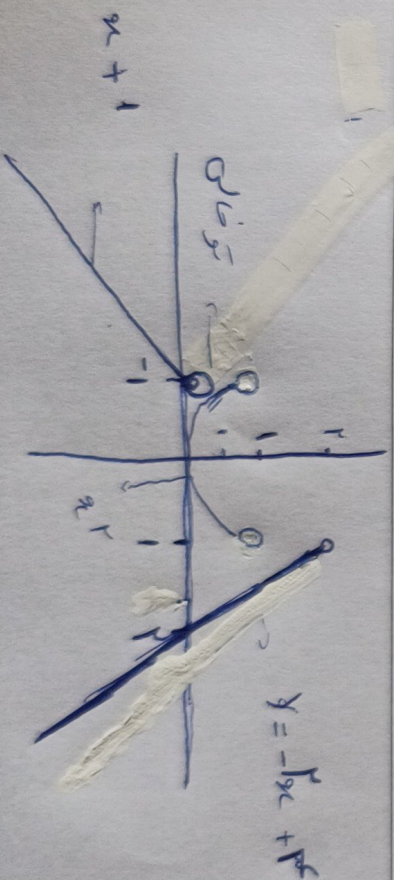
۱۲) $\cot \frac{\pi}{5} = \frac{1}{\tan \frac{\pi}{5}} = \frac{1}{\frac{1}{\sqrt{5}}} = \sqrt{5}$

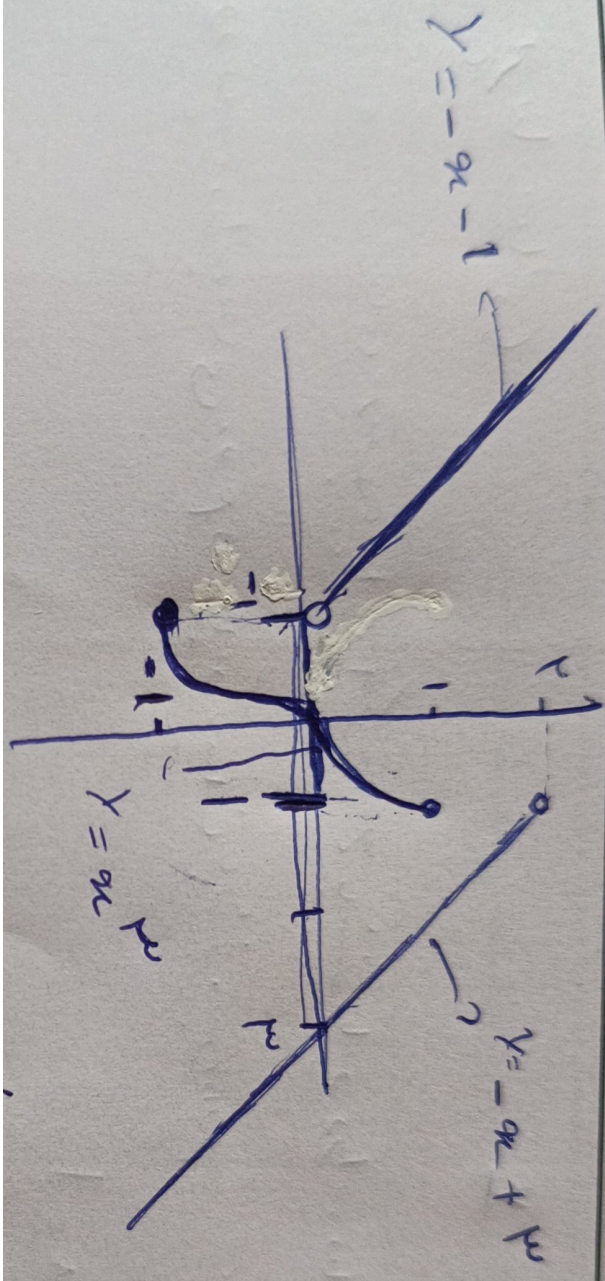
۱۳) $\cos \frac{\pi}{5} = \frac{\sqrt{5} + 1}{4}$ $\sin \frac{\pi}{5} = \frac{\sqrt{5} - 1}{4}$

۱۴) $\tan \frac{\pi}{3} = \frac{\sin \frac{\pi}{3}}{\cos \frac{\pi}{3}} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$

۱۵) $\sin \alpha = \frac{1}{2}$ $\cos \alpha = \frac{\sqrt{3}}{2}$

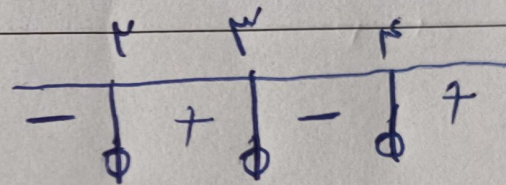
۱۶) $\cos \alpha = \frac{\sqrt{3}}{2} \rightarrow \alpha = \frac{\pi}{6}$ $\sin \alpha = \frac{1}{2}$





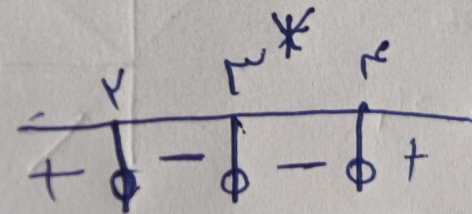
$$الف) \quad Y = (x - 2) (x - 3) (x - 4)$$

$\downarrow$ $\downarrow$ $\downarrow$
 $x = 2$ $x = 3$ $x = 4$



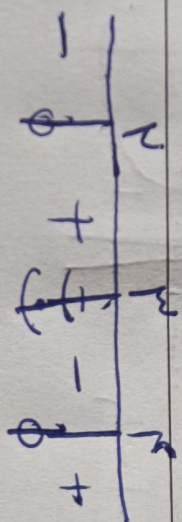
$$ب) \quad Y = (x - 2) (x - 3) (x - 3) (x - 4)$$

$\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$
 $x = 2$ $x = 3$ $x = 3$ $x = 4$

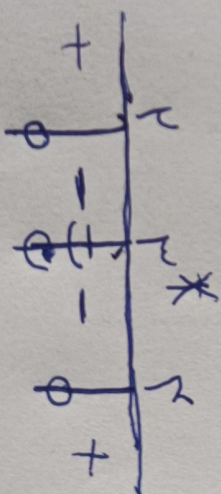


✓

$$x \neq y = \frac{(a_n - y) (a_n - c)}{(a_n - y) - a_n = c}$$



$$x \neq y = \frac{(a_n - y) (a_n - c)}{(a_n - y) (a_n - c)}$$



$$x = \frac{(n-1)(n-r)}{n-r}$$

$$\begin{cases} n=1 \\ n=r \\ n=r \end{cases}$$

$$\frac{-}{+} \frac{+}{-} \frac{+}{+}$$

$$y = \frac{(n-1)(n-r)}{(n-1)(n-r)}$$

$$\begin{cases} n=1 \\ n=r \\ n=r \end{cases}$$

$$+ \frac{-}{+} \frac{+}{-} \frac{+}{+}$$

$$1) Y = \frac{q^Y (q^Y - 1)}{q^Y + q + Y} = \frac{q^Y (q - 1)(q + 1)}{q^Y + q + Y}$$

$$\begin{cases} q = 0 \\ q = 1 \\ q = -1 \end{cases} \quad \begin{array}{c} -1 \\ 0 \\ 1 \end{array} \quad \begin{array}{c} \times \\ \phi \\ -\phi \\ -\phi \\ + \end{array}$$

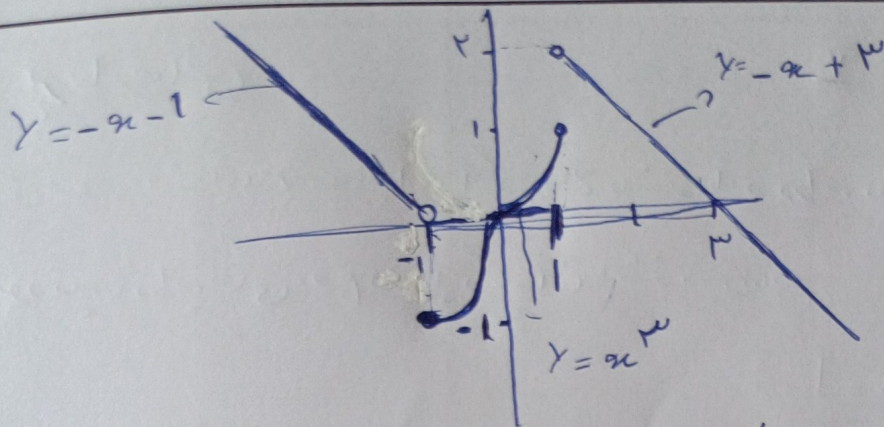
$$\Delta = 1^Y - 1^Y = -Y \quad \text{منفی/مثبت ندارد}$$

منفی/مثبت ندارد

$$Y = \frac{q^Y + Y^2 q + Y^3}{q^Y + Y q + Y^2} = \frac{q^Y - 1^Y}{Y - 1^Y} = \frac{q^Y + Y^2 q + Y^3}{q^Y + Y q + Y^2}$$

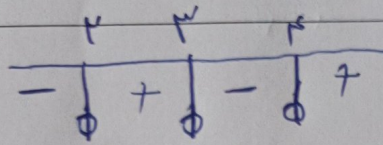
$$\begin{array}{c} q \\ -\infty \\ 0 \\ +\infty \end{array} \quad \begin{array}{c} + \\ + \\ + \end{array}$$

منفی/مثبت ندارد



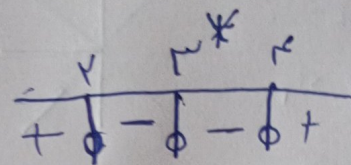
الف) $y = (x-2)(x-3)(x-4)$

$\downarrow$ $\downarrow$ $\downarrow$
 $x=2$ $x=3$ $x=4$



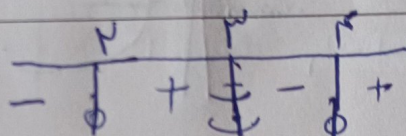
ب) $y = (x-2)(x-3)(x-2)(x-4)$

$\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$
 $x=2$ $x=3$ $x=2$ $x=4$

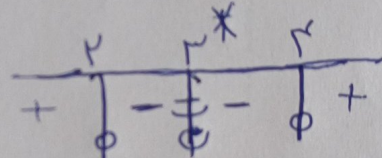


الف) $y = \frac{(x-2)(x-4)}{(x-3)} \rightarrow x=3$

$\downarrow$
 $x=3$

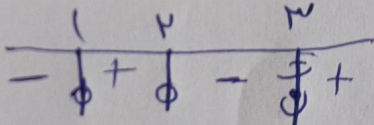


ب) $y = \frac{(x-2)(x-4)}{(x-3)(x-2)}$



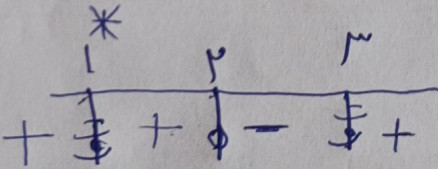
ج) $y = \frac{(x-1)(x-2)}{x-3}$

$\begin{cases} x=1 \\ x=2 \\ x=3 \end{cases}$



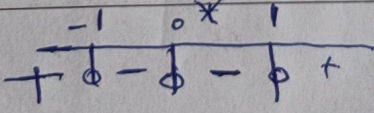
د) $y = \frac{(x-1)(x-2)}{(x-1)(x-3)}$

$\begin{cases} x=1 \\ x=2 \\ x=1 \\ x=3 \end{cases}$



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

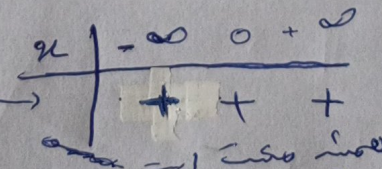
$\begin{cases} x=0 \\ x=0 \\ x=1 \\ x=-1 \end{cases}$



$\Delta = 1^2 - 4 \times 2 = -7$ منفی / ندارد

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

$\Delta = 2^2 - 4 \times 3 = -8$ منفی / ندارد



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