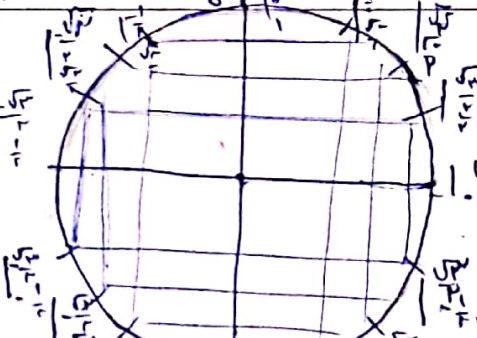


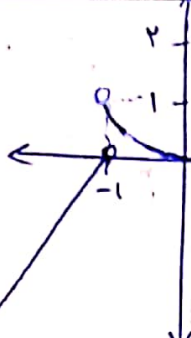
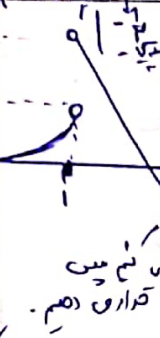
الف) $y^3 = 2m^2 - 1$
 $\rightarrow \begin{cases} y_1^3 = 2m_1^2 - 1 \\ y_2^3 = 2m_2^2 - 1 \end{cases} \xrightarrow{m_1 = m_2} y_1^3 = y_2^3 \rightarrow y_1 = y_2$ تابع یکتا است.
 ب) $y^3 + y = 3m^2 - 1$ $\xrightarrow{[I] \text{ را } y_1 = \frac{-y_2 \pm \sqrt{\Delta}}{2}}$ $\begin{cases} (y_1 - y_2) = 0 \rightarrow y_1 = y_2 \\ y_1^2 + y_1 y_2 + y_2^2 + 1 = 0 \text{ (I)} \end{cases}$
 $\rightarrow \begin{cases} y_1^3 + y_1 = 3m_1^2 - 1 \\ y_2^3 + y_2 = 3m_2^2 - 1 \end{cases} \xrightarrow{m_1 = m_2} y_1^3 + y_1 = y_2^3 + y_2$ $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = y_2 - y_1$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0$

الف) $y = m^2 - 1$ 
 ب) $|y| + my = m^2 + 1 \rightarrow |y| + 0 = 1 \rightarrow |y| = 1 \rightarrow y = \pm 1$
 ج) $y^3 + m^3 = 2m - 1 \rightarrow y = \sqrt[3]{2m - 1 - m^3}$
 د) $\sqrt[3]{y} + \sqrt[3]{m} = 2 \rightarrow \sqrt[3]{y} = 2 - \sqrt[3]{m} \rightarrow y = (2 - \sqrt[3]{m})^3$

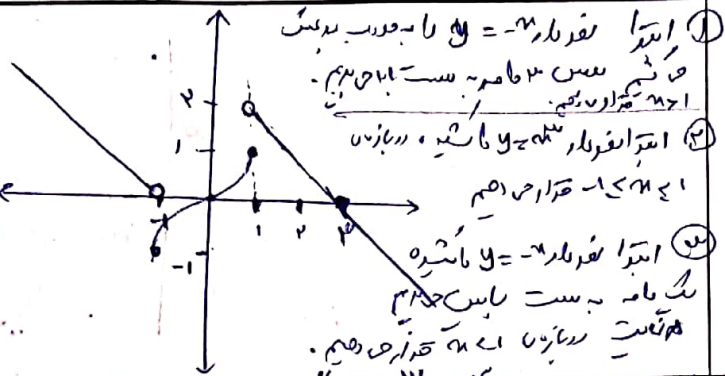
الف) $\tan \frac{\pi}{3} \rightarrow \tan y = \frac{\sin y}{\cos y} \Rightarrow -\sin(\frac{\pi}{3}) = \frac{\sqrt{3}}{2} / \cos(\frac{\pi}{3}) = \frac{1}{2} \Rightarrow \frac{\sqrt{3}}{1} = \sqrt{3}$
 ب) $\cot \frac{5\pi}{4} \rightarrow \cot y = \frac{\cos y}{\sin y} \Rightarrow \cos(\frac{5\pi}{4}) = -\frac{\sqrt{2}}{2} / \sin(\frac{5\pi}{4}) = -\frac{1}{2} \Rightarrow \frac{\sqrt{2}}{1} = \sqrt{2}$
 ج) $\tan 3\pi \rightarrow \tan y = \frac{\sin y}{\cos y} \Rightarrow \sin(3\pi) = 0 / \cos(3\pi) = -1 \Rightarrow \frac{0}{-1} = 0$
 د) $\cot 11\pi \rightarrow \cot y = \frac{\cos y}{\sin y} \Rightarrow \cos(11\pi) = -1 / \sin(11\pi) = 0 \Rightarrow \frac{-1}{0} = \text{تعیین نشده}$

الف) $\sin \alpha = \frac{1}{2} \rightarrow \alpha = \frac{\pi}{6}, \alpha = \frac{5\pi}{6}$
 $\alpha = 30^\circ, \alpha = 150^\circ$
 ب) $\cos \alpha = \frac{\sqrt{2}}{2} \rightarrow \alpha = \frac{\pi}{4}, \alpha = \frac{7\pi}{4}$
 $\alpha = 45^\circ, \alpha = 315^\circ$



الف) $f(m) = \begin{cases} -2m+2 & m > 1 \\ m^2 & -1 < m < 1 \\ m+1 & m < -1 \end{cases}$
 ب) $y = m^2$ 
 ج) $y = -m$ 

$$f(x) = \begin{cases} -x+3 & x > 1 \\ x^2 & -1 \leq x \leq 1 \\ -x-1 & x < -1 \end{cases}$$



الف) $y = (x-2)(x-3)(x-4) = 0$
 $x-2=0 \rightarrow x=2$
 $x-3=0 \rightarrow x=3$
 $x-4=0 \rightarrow x=4$

$x-2$	-	0	+	+	+
$x-3$	-	-	0	+	+
$x-4$	-	-	-	0	+
ρ	-	0	+	0	+

ب) $y = (x-1)(x-2)(x-3)(x-4) = 0$
 $x-1=0 \rightarrow x=1$
 $x-2=0 \rightarrow x=2$
 $x-3=0 \rightarrow x=3$
 $x-4=0 \rightarrow x=4$

$x-1$	-	0	+	+	+
$x-2$	-	-	0	+	+
$x-3$	-	-	-	0	+
$x-4$	-	-	-	-	0
ρ	+	0	-	0	+

الف) $y = (x-2)(x-3)(x-4) = 0$
 $x-2=0 \rightarrow x=2$
 $x-3=0 \rightarrow x=3$
 $x-4=0 \rightarrow x=4$

$x-2$	-	0	+	+	+
$x-3$	-	-	0	+	+
$x-4$	-	-	-	0	+
ρ	-	0	+	0	+

ب) $y = (x-1)(x-2)(x-3)(x-4) = 0$
 $x-1=0 \rightarrow x=1$
 $x-2=0 \rightarrow x=2$
 $x-3=0 \rightarrow x=3$
 $x-4=0 \rightarrow x=4$

$x-1$	-	0	+	+	+
$x-2$	-	-	0	+	+
$x-3$	-	-	-	0	+
$x-4$	-	-	-	-	0
ρ	+	0	-	0	+

الف) $y = x^3 - 3x^2 + 2x = 0$
 $x^3 - 3x^2 + 2x = 0$
 $x(x^2 - 3x + 2) = 0$
 $x=0$
 $x^2 - 3x + 2 = 0$
 $(x-1)(x-2) = 0$
 $x=1$
 $x=2$

x	-	0	+	+	+
$x-1$	-	-	0	+	+
$x-2$	-	-	-	0	+
ρ	+	0	-	0	+

ب) $y = x^3 - 3x^2 + 2x = 0$
 $x^3 - 3x^2 + 2x = 0$
 $x(x^2 - 3x + 2) = 0$
 $x=0$
 $x^2 - 3x + 2 = 0$
 $(x-1)(x-2) = 0$
 $x=1$
 $x=2$

x	-	0	+	+	+
$x-1$	-	-	0	+	+
$x-2$	-	-	-	0	+
ρ	+	0	-	0	+

الف) $y = x^3 - 3x^2 + 2x = 0$
 $x^3 - 3x^2 + 2x = 0$
 $x(x^2 - 3x + 2) = 0$
 $x=0$
 $x^2 - 3x + 2 = 0$
 $(x-1)(x-2) = 0$
 $x=1$
 $x=2$

x	-	0	+	+	+
$x-1$	-	-	0	+	+
$x-2$	-	-	-	0	+
ρ	+	0	-	0	+

ب) $y = x^3 - 3x^2 + 2x = 0$
 $x^3 - 3x^2 + 2x = 0$
 $x(x^2 - 3x + 2) = 0$
 $x=0$
 $x^2 - 3x + 2 = 0$
 $(x-1)(x-2) = 0$
 $x=1$
 $x=2$

x	-	0	+	+	+
$x-1$	-	-	0	+	+
$x-2$	-	-	-	0	+
ρ	+	0	-	0	+