

الف) $3x - y = 9$ و $x + 2y = -4 \Rightarrow -3(x + 2y = -4) \rightarrow -3x - 6y = +12$

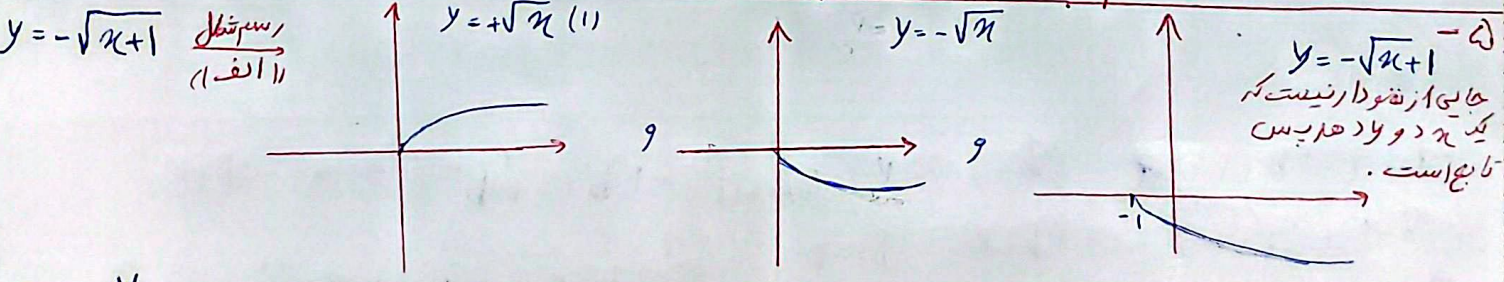
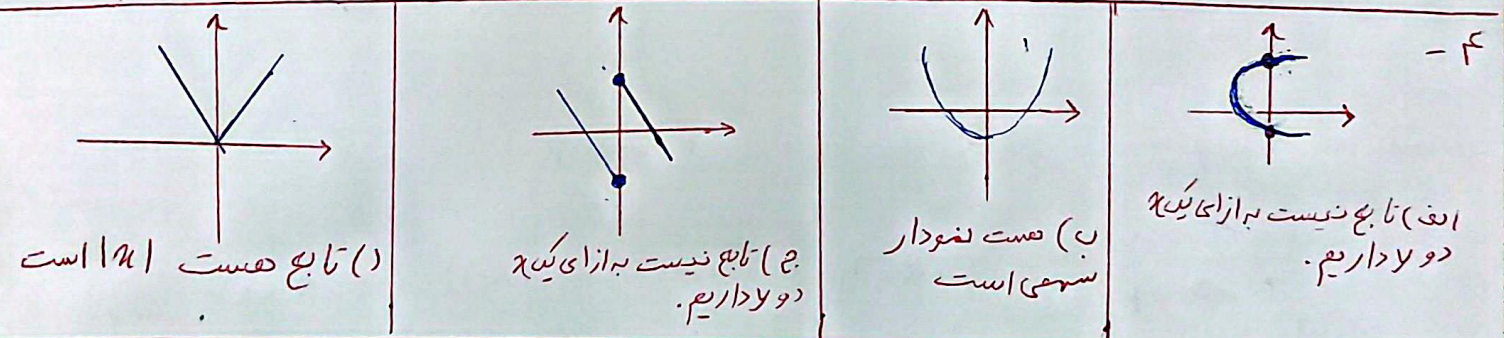
الف) $9 = 3x - y$ و $x + 2y = -4 \Rightarrow -3(x + 2y = -4) \rightarrow -3x - 6y = +12$
 $-7y = 21 \rightarrow y = -3$ و $x - 6 = -4 \Rightarrow x = +2$ $\rightarrow \frac{x}{y} = \frac{2}{-3} = -\frac{2}{3}$

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

$9 + 1 = -2 \rightarrow 9 = -3$ و $\rightarrow f = \{(-3, -6) \text{ و } (1, -2) \text{ و } (2, 0) \}$
 $f(-3) + 2f(2) = 3f(1) \rightarrow +2f(2) = 0 \rightarrow f(2) = 0$

$f = \{(-1, m^2 - 3m) \text{ و } (3, 2) \text{ و } (-1, 2) \text{ و } (m+1, 6) \text{ و } (2, 6) \text{ و } (m^2 + 2, m+1)\}$
 $m^2 - 3m = -2 \rightarrow m^2 - 3m + 2 = 0 \rightarrow (m-1)(m-2) = 0$
 غرق $m = +2$
 غرق $m = +1$

اگر $m = 2$ باشد پیرانتز $(3, 6)$ می شود و تابع نمی شود چون پیرانتز $(3, 6)$ داریم. و اگر $m = 1$ باشد $m+1 = 2$ و $(2, 6)$ و $(2, 4)$ غرق است.



$x = \frac{y}{\sqrt{1-y^2}} \Rightarrow z = \frac{y_1}{\sqrt{1-y_1^2}} \text{ و } z = \frac{y_2}{\sqrt{1-y_2^2}} \rightarrow \frac{y_1}{\sqrt{1-y_1^2}} = \frac{y_2}{\sqrt{1-y_2^2}} \rightarrow \frac{y_1^2}{1-y_1^2} = \frac{y_2^2}{1-y_2^2}$
 $y_1^2(1-y_2^2) = y_2^2(1-y_1^2) \rightarrow y_1^2 - y_1^2 y_2^2 = y_2^2 - y_1^2 y_2^2 \Rightarrow y_1^2 = y_2^2 \rightarrow y_1 = y_2$
 چراغی توان $y_1 = y_2$ باشد که چون در اون صورت دو عبارت مساوی نمی شدن بلکه قرین می شدن در واقع $x_1 = \frac{y_1}{\sqrt{1-y_1^2}}$ و $x_2 = \frac{y_2}{\sqrt{1-y_2^2}}$

$x=f \rightarrow y=\pm f \rightarrow$

ب) $y_1^3 + 3y_1^2 + 3y_1 + 2 = 0$ و $y_2^3 + 3y_2^2 + 3y_2 + 2 = 0$

$y_1^3 + 3y_1^2 + 3y_1 + 2 = y_2^3 + 3y_2^2 + 3y_2 + 2$

$y_1^3 - y_2^3 + 3y_1^2 - 3y_2^2 + 3y_1 - 3y_2 = 0 \rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2) + 3(y_1 - y_2)(y_1 + y_2) = 0$

$3y_1^2 - 3y_2^2 = 3(y_1 - y_2)(y_1 + y_2) \rightarrow 3y_1 - 3y_2 = 3(y_1 - y_2)$

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

این صفره

صفره مثبت

$\rightarrow y_1 = y_2$
تابع است. بوده

$f(\sqrt{3}-2) = \frac{(\sqrt{3}-2)^2 + f(\sqrt{3}-2) + 5}{(\sqrt{3}-2)^2 + f(\sqrt{3}-2) + 7} = \frac{7 - 4\sqrt{3} + 4 + f(\sqrt{3}-2) + 5}{(7 - 4\sqrt{3}) + f(\sqrt{3}-2) + 7} = \frac{f}{6} = \frac{2}{3}$

$-4 = 3(-1) - a \rightarrow -4 = -3 - a \rightarrow a = -4 + 3 \rightarrow a = 1$

$-4 = (-1)^3 + (-1) + b \rightarrow -4 = -2 + b \rightarrow b = -2$

معنی: $x^3 + x - 2$
خط: $3x - 1$

میدانیم یکی از ریشه‌ها طول نقطه $\Delta = (-1)^2 - 4(1)(-1) = 1 + 4 = 5 \rightarrow \frac{1 + \sqrt{5}}{2}$ و $\frac{1 - \sqrt{5}}{2}$
تقاطع یعنی $a=1$ و $b=-2$ (بعضی می‌گویند است).

$$\begin{array}{r} x^3 - 2x - 1 \quad | \quad x+1 \\ -x^3 + x^2 \\ \hline x^2 - 2x - 1 \\ -x^2 + x \\ \hline -x - 1 \\ +x + 1 \\ \hline 0 \end{array}$$

$\Rightarrow x^2 - x - 1 = 0$
مجموع $\frac{1 + \sqrt{5}}{2} + \frac{1 - \sqrt{5}}{2} = \frac{1+1}{2} = \frac{2}{2} = 1$
ریشه‌ها

$a+b = 2a = 2a - 2b + 1 \rightarrow a+b = 2a \rightarrow b = a$

$2a = a - 2a + 1 \rightarrow 2a = -a + 1 \rightarrow 3a = 1 \rightarrow a = \frac{1}{3}$

$b = a = \frac{1}{3}$

$3x^2 - ax + c + 1 - bx^2 - 3x = 0$

$-3x = -ax \rightarrow a = 3$ و $x^2 = -bx^2 \rightarrow b = -3$ $c = 1$

$a + b + c = 3 - 3 + 1 = -1 + 1 = 0$