

الف)
$$\begin{cases} 3x - y = 9 \rightarrow 4x - 2y = 11 \\ x + 2y = -4 \rightarrow x + 2y = -4 \end{cases} \xrightarrow{+} \begin{cases} 3x - y = 9 \\ x + 2y = -4 \end{cases} \rightarrow \begin{cases} 2x - 3y = 13 \\ 2x - 3y = 13 \end{cases} \rightarrow \begin{cases} 2x = 13 \\ x = 2 \\ y = -3 \end{cases} \rightarrow \frac{x}{y} = \frac{2}{-3} = \left(-\frac{2}{3}\right)$$

ب)
$$\begin{cases} \frac{1}{x} - \frac{1}{y} = -1 \rightarrow y - x = -xy \xrightarrow{\times(-3)} -3y + 3x = 3xy \\ \frac{5}{x} - \frac{y}{y} = -3 \rightarrow 5y - 7x = -3xy \rightarrow \frac{5y - 7x}{2y - 4x} = \frac{-3xy}{2y - 4x} \rightarrow y = 2x \end{cases} \rightarrow \frac{x}{y} = \frac{x}{2x} = \left(\frac{1}{2}\right)$$

$f = \{(a, 2a), (1, a+1), (1, -2), (2, b)\}$

$f(a) + 2f(2) = 3f(1)$

$2a + 2b = 3(a+1) + 3(-2)$

$2a + 2b = 3a + 3 - 6$

$2b - a = -9$

$2b = 0$

$b = 0$

$a + 1 = -2$

$a = -3$

$f = \{(-1, m^2 - 3m), (2, 5), (-1, -2), (m+1, 4), (2, 4), (m^2 + 2, 2m + 1)\}$

$m^2 - 3m = -2$

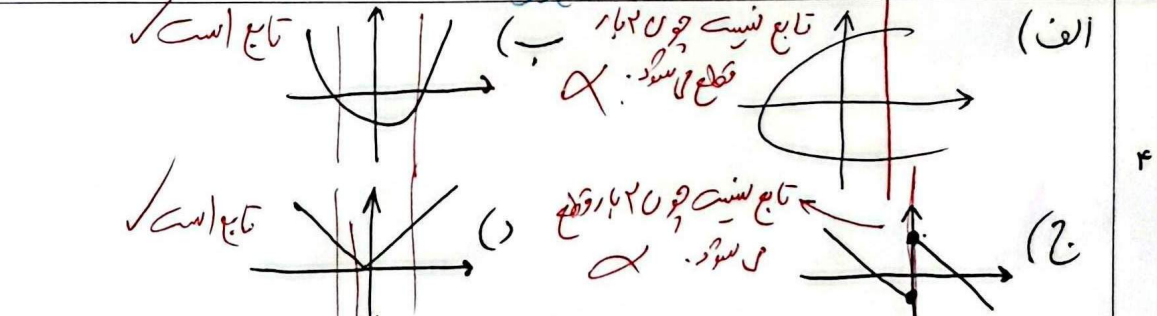
$m^2 - 3m + 2 = 0$

$(m-1)(m-2) = 0$

$m = 1$ $(2, 4)$ $(2, 4)$

$m = 2$ $(3, 5)$ $(3, 4)$

میزان تابع مقدار



الف) $y = \sqrt{x+1}$ تابع است

ب) $x = \frac{y}{\sqrt{1-y^2}}$ $x_1 = x_2$

$\frac{y_1}{\sqrt{1-y_1^2}} = \frac{y_2}{\sqrt{1-y_2^2}} \xrightarrow{(\cdot)^2} \frac{y_1^2}{1-y_1^2} = \frac{y_2^2}{1-y_2^2}$

$y_1^2 - y_1^2 y_2^2 = y_2^2 - y_2^2 y_1^2$

$y_1^2 = y_2^2 \rightarrow y_1 = y_2$

مخرج کسرها مثبت هستند پس y_1 و y_2 هم علامتند.

$y_1 = y_2$ تابع است

الف) $|y| = n$ تابع نسبی \rightarrow دو نقطه: $n=1 \rightarrow y=1$
 $\rightarrow y=-1$

ب) $y^3 + 3y^2 + 3y + n + n = 0$ $(y+1)^3 - 1 = -n^3 - n$
 $(y+1)^3 = y^3 + 3y^2 + 3y + 1$ $(y+1)^3 = -n^3 - n + 1$
 $y = \sqrt[3]{-n^3 - n - 1}$ تابع است

$f(n) = \frac{n^3 + 3n + 1}{n^3 + 3n + 1} \rightarrow \frac{(n+1)^3 + 1}{(n+1)^3 + 3} \xrightarrow{n=\sqrt{3}-1} \frac{(\sqrt{3})^3 + 1}{(\sqrt{3})^3 + 3} = \frac{4}{4} = 1$

$f(\sqrt{3}-1) = ? = 1$

$y = 3n - a \xrightarrow[n=-1]{y=-1} -1 = 3(-1) - a \rightarrow a = 1$ $f(n) = n^3 + an + b$ تابع
 $y = \frac{n^3 + an + b}{n} \xrightarrow[n=-1]{y=-1} -1 = \frac{-1 + a(-1) + b}{-1} \rightarrow b = -2$ $y = 3n + a = 0$ خط

$\rightarrow 3n - 1 = n^3 + n - 2$
 $n^3 - 2n - 1 = 0$ چون از $n = -1$ است پس $n+1$ جمله می باشد.

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

 در نقطه $(-1, -1)$ قطع می کند.
 $(n+1)(n^2 - n - 1) = 0$
 $n = -1$
 مجموع آرایه ها: $-\frac{b}{a} = \frac{1}{1} = 1$

اگر تابع $f(n) = \frac{1}{3}(n, a+b), (1, 2a), (-1, a-2b+1)$ باشد:

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

$f(n) = \frac{3n^3 - an + c + 1}{bn + 3}$ تابع گویا
 $n(bn + 3) = 3n^3 - an + c + 1$
 $bn^2 + 3n = 3n^3 - an + c + 1$

$3n^3 - bn^2 - an - 3n + c + 1 = 0 \rightarrow (3-b)n^2 + (-a-3)n + (c+1) = 0$
 $3-b=0 \rightarrow b=3$ $-a-3=0 \rightarrow a=-3$ $a+b+c = -3+3-1 = -1 = 0$