

الف  $\begin{cases} 3x - y = 9 \rightarrow 6x - 2y = 18 \\ x + 2y = -4 \rightarrow x + 2y = -4 \end{cases} \rightarrow 7x = 14 \rightarrow x = 2 \rightarrow y = -2 \rightarrow \frac{x}{y} = \frac{2}{-2} = -\frac{2}{2}$

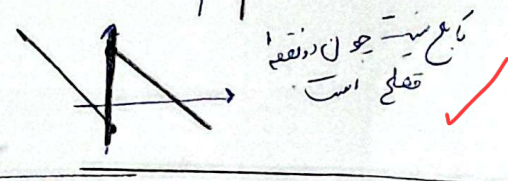
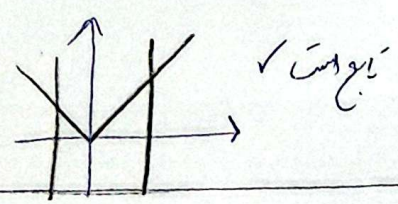
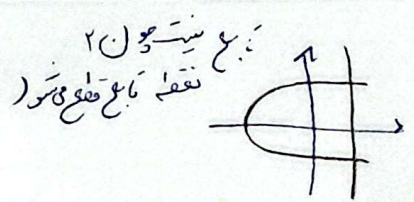
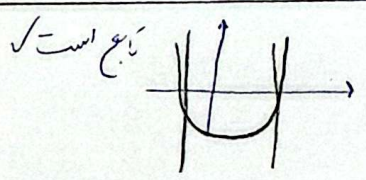
ب  $\begin{cases} \frac{1}{x} - \frac{1}{y} = -1 \rightarrow y - x = -xy \xrightarrow{\times (-2)} -2y + 2x = 2xy \\ \frac{5}{x} - \frac{4}{y} = -2 \rightarrow 5y - 4x = -2xy \rightarrow 5y - 4x = -2xy \end{cases} \rightarrow \frac{5y - 4x}{2y - 4x} = 0 \rightarrow y = 2x \rightarrow \frac{x}{y} = \frac{x}{2x} = \frac{1}{2}$

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

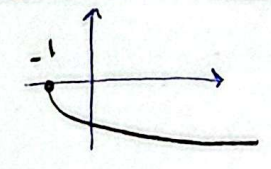
$f(a) + 2f(2) = 3f(1) \rightarrow \frac{2a}{-4} + \frac{2b}{2} = \frac{3(a+1)}{2x-2} \rightarrow 2b = 9 = -9 \rightarrow b = 0$

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

$m^2 - 3m = -2 \rightarrow m^2 - 3m + 2 = 0 \rightarrow (m-1)(m-2) = 0 \rightarrow m = 1 \rightarrow (2, 4), (2, 4)$   
 $m = 2 \rightarrow (2, 5), (3, 4)$   
 برابر ہی ہیں مقدار



الف  $y = -\sqrt{x+1}$  تابع است



ب  $x = \frac{y}{\sqrt{1-y^2}} \rightarrow x_1 = x_2 \rightarrow \frac{y_1}{\sqrt{1-y_1^2}} = \frac{y_2}{\sqrt{1-y_2^2}} \rightarrow \frac{y_1^2}{1-y_1^2} = \frac{y_2^2}{1-y_2^2}$

$\Rightarrow y_1^2 - y_1^2 y_2^2 = y_2^2 - y_2^2 y_1^2 \Rightarrow y_1^2 = y_2^2 \rightarrow y_1 = y_2$  تابع است

الف)  $|y| = x$   $\xrightarrow{\text{تبع}}$   $x = 1 \begin{cases} y = 1 \\ y = -1 \end{cases}$  (2)

ب)  $y^2 + 2y^2 - 2y + x^2 - x = 0$   
 $(y+1)^2 - 1 = -x - x$   
 $(y+1)^2 = -x^2 - 2x + 1 \Rightarrow y = \sqrt{1-x^2-x-1}$   $\xrightarrow{\text{تبع}}$

$f(x) = \frac{x^2 + 2x + a}{x^2 + 2x + 1} \rightarrow \frac{(x+1)^2 + a}{(x+1)^2 + 1} \xrightarrow{x = \sqrt{r}-1} \frac{(\sqrt{r})^2 + a}{(\sqrt{r})^2 + 1} = \frac{r}{r} = \frac{1}{r}$

$f(\sqrt{r}-1) = \frac{1}{r}$  (2)

$y = 2x - a \xrightarrow{x=-1} -2 - a \rightarrow a = 1$  f(x) = ax + b

$y = x^2 + ax + b \xrightarrow{x=-1} -1 - 1 + b \rightarrow b = -1$  (2)  
 $\hookrightarrow 2x - 1 = x^2 + ax - 1$   
 $x^2 - 2x = 0$   
 $x(x-2) = 0$   
 $x = 0, 2$

الف)  $f(x) = \{(1, a+b), (1, a), (-1, a-b-1)\}$   $\xrightarrow{\text{تبع}}$   
 $a+b = 1 \rightarrow b = 1-a$   
 $a - (1-a) = 1 \rightarrow a - 1 + a = 1 \rightarrow 2a = 2 \rightarrow a = 1$  (2)

$f(x) = \frac{cx^2 + ax + c+1}{bx^2 + 1} = x \rightarrow a(bx^2 + 1) = cx^2 + ax + c + 1$   
 $bax^2 + a = cx^2 + ax + c + 1$   
 $(b-a)x^2 + a - c - 1 = 0 \rightarrow (b-a)x^2 + (-a + 1 + c + 1) = 0$   
 $b-a = 0 \rightarrow b = a$   
 $c+1 = 0 \rightarrow c = -1$   
 $a+b+c = -1+1+1 = 1$  (2)