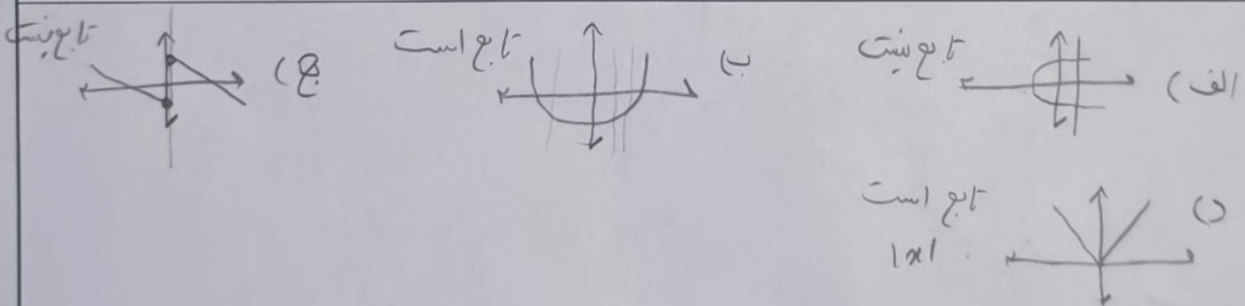


الف $(9, x+2y)$ و $(3x-y, -4) \rightarrow x+2y=-6 \rightarrow x=-2y-6 \rightarrow x=2$
 $\rightarrow 9=3(-2y-6)-y \rightarrow 9=-6y-12-y$
 $11y=-21 \rightarrow y=-\frac{21}{11}$
 $\rightarrow \frac{x}{y} = \frac{2}{-\frac{21}{11}} = -\frac{22}{21}$

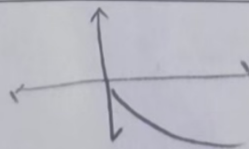
ب $(-1, -3)$ و $(\frac{1}{x}-\frac{1}{y}, \frac{5}{x}-\frac{y}{y}) \rightarrow \frac{1}{x}-\frac{1}{y}=-1 \rightarrow \frac{1}{x}=-\frac{1}{y}-1 \rightarrow x=-\frac{y}{1+y}$
 $\rightarrow -3=5(\frac{1}{x}-1)-\frac{y}{y} \rightarrow -3=5(\frac{1}{-\frac{y}{1+y}}-1)-1$
 $\rightarrow -3=-\frac{5(1+y)}{y}-1 \rightarrow -3=-\frac{5+y}{y} \rightarrow -3y=-5-y \rightarrow -2y=-5 \rightarrow y=-\frac{5}{2}$
 $\rightarrow \frac{x}{y} = \frac{-\frac{5}{2}}{-1} = \frac{5}{2}$

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

$f = \{(-1, m^2-3m), (3, 5), (-1, -2), (m+1, 4), (2, 4), (m^2+2, 4m+1)\}$
 $\rightarrow m^2-3m=-2 \rightarrow m^2-3m+2=0 \rightarrow (m-1)(m-2)=0$
 $m=1$
 $\rightarrow \{(-1, -2), (3, 5), (-1, -2), (2, 4), (2, 4), (3, 5)\}$



$y = -\sqrt{x+1}$



تابع است

$x = \frac{y}{\sqrt{1-y^2}}$ $\rightarrow$ تابع نیست فقط در $0 \leq x < 1$ تعریف شده

الف) $|y| = x \rightarrow y = \pm x$ ب.ق.ست

ب) $y''' + 3y'' + 3y' + x^2 + x = 0$

$y''' + 3y'' = -(x^2 + x + 3y')$ ب.ق.ست

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$$f(x) = \frac{x^2 + 5x + 6 + 1}{x^2 + 3x + 4 + 3} \rightarrow \frac{(x+2)^2 + 1}{(x+1)^2 + 3} = \frac{(\sqrt{3})^2 + 1}{(\sqrt{3})^2 + 3} = \frac{4}{4} = \frac{1}{1}$$

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$f(x) = x^3 + ax + b, y = 3x - a, (-1, -\varepsilon)$

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

$3 - a = -\varepsilon \rightarrow -a = -1 \rightarrow a = 1$

$f(x)$

$\Rightarrow x^3 - 2x - 1, y = 3x - 1$
 $(x+1)(-x^2 - x + 1)$
 -1

$x_1, x_2 = \frac{\sqrt{5} \pm 1}{2} \Rightarrow x_1 + x_2 = 0$

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

$a+b = 2a$
 $b = a$

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

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

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$\frac{f(x^2 - ax + c + 1)}{bx + 3} = x \rightarrow bx^2 - ax + c + 1 = bx^2 + 3x$

$\rightarrow b = 3$

$a = 0$

$c = 2$

$\rightarrow a + b + c = 5$

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