

$2(x - y = 9) = 4x - 2y = 18$
 $x + 2y = -4$

$\frac{x}{y} = -\frac{p}{q}$

$4x = 18 \Rightarrow x = \frac{9}{2} \Rightarrow 2 + 2y = -4 \Rightarrow 2y = -6 \Rightarrow y = -3$

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

$\frac{2}{x} - \frac{1}{y} = -1$

$\frac{2}{x} - \frac{1}{y} = -1$

$\frac{2}{x} = 2 \Rightarrow x = 1$
 $x = -\frac{1}{2}$

$\frac{x}{y} = \frac{1}{-3} = -\frac{1}{3}$

سوال ۷

$10a + 2(b) = 10(-1)$
 $-10 + 2b = -10 \Rightarrow b = 0$

$10 + 1 = -10 \Rightarrow 11 = -10$

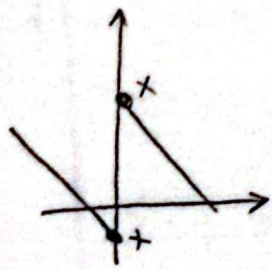
سوال ۱۳

$m^2 - 13m = -2 \Rightarrow m^2 - 13m + 13 = 0$ $(m-1)(m-12) = 0$

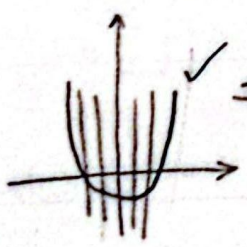
$m \rightarrow 1 \Rightarrow \{(-1, -2), (4, 5), (-1, -2), (4, 4), (2, 4), (13, 5)\} \rightarrow$ تابع نسبی

$\rightarrow 2 \Rightarrow \{(-1, -2), (4, 5), (-1, -2), (4, 4), (2, 4), (4, 9)\} \rightarrow$ تابع نسبی

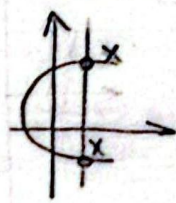
پس \leftarrow به ازای هیچ مقداری از m



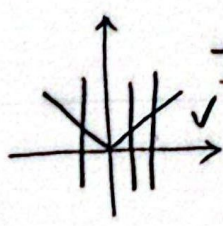
(2) تابع نسبی



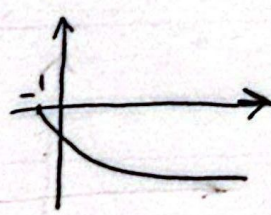
(ب) تابع نسبی



(سوال ۴) الف تابع نسبی



(د) تابع نسبی



✓ تابع نسبی

سوال ۵

الف $y = \sqrt{x+1}$

ب) $x = \frac{y}{\sqrt{1-y^2}}$

$\frac{y}{\sqrt{1-y^2}} = \frac{y_1}{\sqrt{1-y_1^2}} = \frac{y_2}{\sqrt{1-y_2^2}}$

$\frac{y^2}{1-y^2} = \frac{y_1^2}{1-y_1^2} = \frac{y_2^2}{1-y_2^2}$

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

$y_1^2 = y_2^2$

$\Rightarrow |y_1| = |y_2|$

✓ $y_1 = y_2$ تابع نسبی

که با توجه به اینکه y_1 و y_2 هم علامتند

الف) $|y| = x \xrightarrow{\text{نقل ناقص}} |y| = 1 \Rightarrow y = \pm 1 \rightarrow$ تابع زوج

ب) $y^{10} + 10y^9 + 45y^8 + \dots + 1 \rightarrow -y_1^{10} - 10y_1^9 - 45y_1^8 - \dots - y_2^{10} - 10y_2^9 - 45y_2^8 - \dots$

$y_1^{10} + 10y_1^9 + 45y_1^8 = y_2^{10} + 10y_2^9 + 45y_2^8$

$y_1^{10} - y_2^{10} + 10y_1^9 - 10y_2^9 + 45y_1^8 - 45y_2^8 + \dots + 1 - 1 = 0$

$(y_1 + 1)^{10} - (y_2 + 1)^{10} = 0$

$\Rightarrow (y_1 + 1)^{10} = (y_2 + 1)^{10} \Rightarrow y_1 + 1 = y_2 + 1 \Rightarrow y_1 = y_2 \rightarrow$ تابع زوج

$\frac{x^2 + 2x + 2}{x^2 + 2x + 1} = \frac{(\sqrt{10}-2)^2 + 4(\sqrt{10}-2) + 2}{(\sqrt{10}-2)^2 + 4(\sqrt{10}-2) + 1} = \frac{10 + 4 - 4\sqrt{10} + 4\sqrt{10} - 8 + 2}{10 + 4 - 4\sqrt{10} + 4\sqrt{10} - 1} = \frac{8}{9}$ سؤال ٥

$-k = -1 - a + b \Rightarrow -1 - a + b = -10 - a$

$-k = -10 - a$

$-1 + b = -10 \Rightarrow b = -9$
 $a = 1$

$x^2 - x - 1 = 0$

$b^2 - 4ac = 1 - 4(1)(-1) = 5$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{1 \pm \sqrt{5}}{2}$

$\frac{1}{2} + \frac{\sqrt{5}}{2} + \frac{1}{2} - \frac{\sqrt{5}}{2} = 1 \rightarrow$ مجموع الجذور

$x^{10} + x - 1 = 10x - 1$

$x^{10} - 9x - 1 = 0$

$x^{10} - x - x - 1 \Rightarrow x(x^9 - 1) - (x + 1) = 0$

$x(x+1)(x-1) - (x+1) = 0$

$(x+1)[x(x-1) - 1] = 0 \Rightarrow (x+1)(x^2 - x - 1) = 0$

سؤال ٩

$a + b = 10 \Rightarrow a = 10 - b$

$10a = a - 10b + 1$

$\Rightarrow 10a = a - 10a + 1 \Rightarrow 19a = 1 \Rightarrow a = 1/19$

سؤال ١٠

$\frac{kx^2 - ax + c + 1}{bx + 10} = x \Rightarrow \frac{kx^2 - ax + c + 1}{bx + 10} = \frac{bx^2 + 10x}{bx + 10}$

$\Rightarrow b = k$

$\Rightarrow -a = 10 \Rightarrow a = -10$

$\Rightarrow c + 1 = 0 \Rightarrow c = -1$

$a + b + c = -10 + 10 + (-1) = -1$