

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

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

سوال ۱۵

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

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

$\frac{2}{x} - \frac{1}{y} = -4$

$\frac{2}{x} - \frac{1}{y} = -4$

$\frac{2}{x} = 2 \Rightarrow x = 1$
 $x = -\frac{1}{4}$

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

سوال ۲

$2a + 2(b) = 2(-1)$
 $-4 + 2b = -2 \Rightarrow b = 1$

$a + 1 = -2 \Rightarrow a = -3$

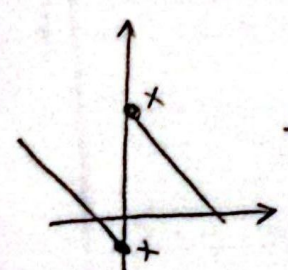
$m^2 - 3m = -2 \Rightarrow m^2 - 3m + 2 = 0 \Rightarrow (m-1)(m-2) = 0$

سوال ۳

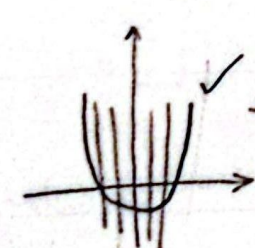
$m \rightarrow 1 \Rightarrow \{(-1, -2), (4, 5), (-1, -2), (4, 4), (2, 4), (3, 5)\} \rightarrow$ تابع نسبی

$\rightarrow 2 \Rightarrow \{(-1, -2), (3, 5), (-1, -2), (4, 4), (2, 4), (4, 5)\} \rightarrow$ تابع نسبی

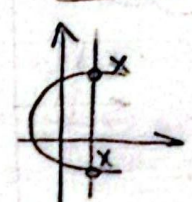
پس \leftarrow به ازای هیچ مقداری از m



(2) تابع نسبی

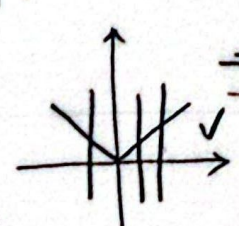


(ب) تابع نسبی



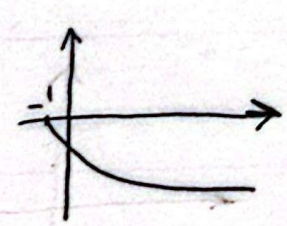
(4) الف تابع نسبی

سوال ۶



(د) تابع نسبی

$y = \sqrt{x+1}$ (الف)



✓ تابع نسبی

سوال ۷

$x = \frac{y}{\sqrt{1-y^2}}$ (ب)

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

$y_1^2 = y_2^2$

$\Rightarrow |y_1| = |y_2|$

\checkmark تابع نسبی $\leftarrow y_1 = y_2$ 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

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

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

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

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

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

$\frac{x^2 + 2x + 2}{x^2 + 2x + 1} = \frac{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 2}{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 1} = \frac{4+4\sqrt{3}-4-4\sqrt{3}+4-4\sqrt{3}-4+4\sqrt{3}-1+2}{4+4\sqrt{3}-4-4\sqrt{3}+4-4\sqrt{3}-4+4\sqrt{3}-1+2} = \frac{4}{4} = 1$

سؤال ٥

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

سؤال ٦

$x^2 - x - 1 = 0$

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

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

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

$x^k + x - 1 = kx - 1$

$x^k - kx - 1 = 0$

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

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

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

سؤال ٩

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

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$pa = a - pb + 1$

$\Rightarrow pa = a - pa + 1 \Rightarrow pa = -a + 1 \Rightarrow pa = 1 \Rightarrow a = 1/p$

سؤال ١٠

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

$\Rightarrow b = k$
 $\Rightarrow -a = k \Rightarrow a = -k$
 $\Rightarrow c + 1 = 0 \Rightarrow c = -1$
 $a + b + c = -k + k + (-1) = -1$