

<p>الف) <math>\begin{cases} x + 2y - z = 4 \\ 3x - y = 9 \end{cases}</math></p>	<p><math>\begin{cases} x + 2y = 4 + z \\ 3x - y = 9 \end{cases} \rightarrow \begin{cases} x + 2y = 4 + z \\ 9 - 3y = 9 - 3z \end{cases}</math>  <math>\frac{x}{y} = \frac{4+z}{3}</math></p>	
<p>ب) <math>\frac{y-x}{xy} = -1 \rightarrow y-x = -xy</math>  <math>\frac{y-vx}{xy} = -3 \rightarrow y-vx = -3xy</math></p>	<p><math>\begin{cases} y - vx = -3xy \\ -y + vx = +3xy \\ -x^2 + 4xy \\ y = -1 \quad x = \frac{-1}{3} \end{cases}</math></p>	<p>۱  <math>\frac{x}{y} = \frac{-1}{3}</math></p>
<p><math>a_1 + 2 = 2</math>  <math>a_2 = 2</math></p>	<p><math>f(a) = 2f(1) = 3f(1)</math>  <math>na + 2b = ma + 3</math>  <math>-4 + 2b = -6</math>  <math>\begin{cases} b = 2 \\ b = 0 \end{cases}</math></p>	<p>۲</p>
<p><math>m^2 - 3m = 2</math>  <math>m^2 - 3m + 2 = 0</math>  <math>(m-1)(m-2) = 0</math>  <math>m = 1, 2</math></p>	<p><math>m=1 \rightarrow \{(2, 2), (2, 4)\}</math>          تابع نیست  <math>m=2 \rightarrow \{(3, 5), (3, 6)\}</math>          تابع نیست</p>	<p>۳          هیچ صدا</p>
<p>الف) تابع <math>x</math> نیست          ب) تابع <math>\checkmark</math> هست <math>y = x^2</math>          ج) تابع <math>x</math> نیست <math>x = 0</math>          د) تابع <math>\checkmark</math> هست <math>x = 1</math></p>	<p>۴</p>	
<p>الف) <math>\begin{cases} y_1 = -\sqrt{x+1} \\ y_2 = -\sqrt{x+2} \end{cases} \rightarrow y_1 = y_2</math>          تابع هست</p>	<p>ب) <math>\frac{x=1}{y^2} \rightarrow (y)^2 = (\sqrt{1-y^2})^2</math>  <math>y^2 = 1 - y^2</math>  <math>2y^2 = 1 \rightarrow y^2 = \frac{1}{2} \Rightarrow y = \pm \sqrt{\frac{1}{2}}</math>          تابع نیست</p>	<p>۵  <math>\frac{1}{2}</math></p>

<p>الف) <math> y  = 4 \rightarrow y = \pm 4</math> تابع نیست</p>	
<p>ب) <math>y = -x</math>  <math>\rightarrow -x^3 + 3x^2 - 2x + 2x + x = 0</math>  <math>3x^2 - 2x = 0</math>  <math>x(3x - 2) = 0</math>  <math>x = 0</math>  <math>x = \frac{2}{3}</math></p> <p>تابع نیست</p> <p style="text-align: right;">(1/5)</p>	6
<p><math>f(\sqrt{3}-1) = \frac{(\sqrt{3}-1)^3 + 3(\sqrt{3}-1) + 4}{(\sqrt{3}-1)^2 + 3(\sqrt{3}-1) + 7}</math></p> <p><math>\frac{3 + 3\sqrt{3} - 3\sqrt{3} - 1 + 4}{3 + 3\sqrt{3} + 3\sqrt{3} - 1 + 7} = \frac{6}{4} = \frac{3}{2}</math></p> <p style="text-align: right;">(2)</p>	7
<p><math>\rightarrow y = 3x - a</math>  <math>-f = 3 - a \Rightarrow a = 3</math></p> <p><math>f(x) = x^3 + ax + b = a^3 + a^2 + b = -a</math>  <math>-a^3 - a^2 - b = -a</math>  <math>b = -a^3 - a^2 + a</math></p> <p><math>y = 3x - 1</math>  <math>f(x) = x^3 + x - 1</math></p> <p><math>x^3 + x - 1 = 0</math>  <math>x^3 - 1 = -2x</math>  <math>(x-1)(x^2 + x + 1) = -2x</math>  <math>x=0 \rightarrow x=0, y=-1</math>  <math>x=1 \rightarrow x=1, y=0</math></p> <p style="text-align: right;">(1/10)</p>	8
<p><math>a + b = 2a \Rightarrow a = b</math>  <math>a + b = 2a \Rightarrow a = b = \frac{1}{2}</math></p> <p><math>a + b = 2a \Rightarrow a = b = \frac{1}{2}</math></p> <p style="text-align: right;">(3)</p> <p style="text-align: right;"><math>a = \frac{1}{2}</math></p>	9
<p><math>x=0 \rightarrow \frac{c+1}{2} = 0 \rightarrow c+1=0 \rightarrow c=-1</math></p> <p><math>x=1 \rightarrow \frac{c-a}{b+2} = 1 \rightarrow c-a = b+2</math>  <math>a=b+1</math></p> <p><math>x=2 \rightarrow \frac{1c-2a}{2b+3} = 2 \rightarrow 1c-2a = 2b+4</math>  <math>a+b+c = 5-1+2 = 6</math></p> <p><math>\begin{cases} a+b+c=5 \\ a+b=2 \\ -a=2 \end{cases}</math>  <math>a = -2</math>  <math>b = 7</math>  <math>a+b+c = 5-1+2 = 6</math></p> <p style="text-align: right;">(4)</p>	10

$$x = \frac{y}{\sqrt{1-y^2}} \rightarrow \frac{y_1}{\sqrt{1-y_1^2}} = \frac{y_2}{\sqrt{1-y_2^2}} \rightarrow \frac{y_1^2}{1-y_1^2} = \frac{y_2^2}{1-y_2^2} \quad \underline{5}$$

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$$\rightarrow y_1^2 - \cancel{y_1^2 y_2^2} = y_2^2 - \cancel{y_1^2 y_2^2} \xrightarrow{\substack{y_1, y_2 \\ \text{هم علامت}}} y_1 = y_2 \rightarrow \text{رابطه تابعست} \checkmark$$

$$y^3 + 3y^2 + 3y = -x^3 - x \xrightarrow{+1} y^3 + 3y^2 + 3y + 1 = -x^3 - x + 1$$

$$(y+1)^3 = -x^3 - x + 1 \rightarrow y+1 = \sqrt[3]{-x^3 - x + 1} \rightarrow y = \sqrt[3]{-x^3 - x + 1} - 1 \rightarrow \text{تابعست!} \quad \underline{4}$$

$$y - 3x + a = 0 \xrightarrow{(-1, -2)} -2 + 3 + a = 0 \rightarrow a = 1$$

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

$$3x - 1 = x^2 + x - 2 \rightarrow x^2 - 2x - 1 = 0 \quad \xrightarrow{x=-1} \quad (x+1)(x^2 - x - 1) = 0 \quad \Delta > 0 \rightarrow S = -\frac{b}{a} = 1$$

ریشه عبارت