

الف) $|y| = x \rightarrow x = 1 \rightarrow |y| = 1 \rightarrow y = \pm 1$ Ⓟ تابع نسبت X

ب) $y^3 + 3y^2 + 3y + 1 + x^3 + x^2 + x = 0 \rightarrow [(y+1)^3 - 1] + x^3 + x^2 + x = 0 \rightarrow (y+1)^3 = 1 - x^3 - x^2 - x$

$\rightarrow \sqrt[3]{(y+1)^3} = \sqrt[3]{1 - x^3 - x^2 - x} \rightarrow y = y_1 = y_2 \rightarrow \sqrt[3]{1 - x^3 - x^2 - x}$ تابع هست

$(\sqrt{3}-2)^2 = 3 - 4\sqrt{3} + 4$ Ⓡ

$f(x) = \frac{x^2 + 16x + 5}{x^2 + 16x + 17} \Rightarrow f(\sqrt{3}-2) = \frac{3 - 16\sqrt{3} + 16 + 5}{3 - 16\sqrt{3} + 16 + 17} = \frac{16}{4} = \frac{4}{1}$

$y - 3x + a = 0 \rightarrow y = 3x - a \rightarrow -1^2 = 3(-1) - a \rightarrow a = 2$ Ⓜ

$f(x) = x^3 + ax^2 + b \rightarrow -1^2 = (-1)^3 + a(-1) + b \rightarrow -1 + 1 + b \rightarrow b = 0$ ~~$b = 0$~~

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

نقطه تقاطع: $x^3 - 2x - 1 = 3x + 1 \rightarrow x^3 - 5x - 2 = 0$

سوزن همی با کلمه

15

$f(-1) = (-1)^3 + a(-1) + b = -1 - a + b = -1$ Ⓜ

$y = 3x - a \rightarrow y(-1) = 3x - 1 - a = -1 - a = -1$

$-1 - 1 + b = -1 \rightarrow -2 + b = -1 \rightarrow b = 1$

$x^3 + x - 2 = 3x - 1 \rightarrow x^3 - 2x - 1 = 0$ یکی از ریشه‌ها

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

$x_2 = \frac{1 + \sqrt{5}}{2} \rightarrow x_1 = 0$

$x_3 = \frac{1 - \sqrt{5}}{2} \rightarrow x_2 + x_3 = \frac{1 + \sqrt{5} + 1 - \sqrt{5}}{2} = 1$

جواب نهایی: 1

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

تابع ثابت 9

$$a+b = 2a = a-2b+1 \rightarrow \text{معادله اول} : a+b = 2a \rightarrow a = b$$

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

5

$$f(x) = \frac{4x^4 - ax^2 + c + 1}{bx + 3} \rightarrow 4x^4 - ax^2 + c + 1 = bx^2 + 3bx$$

مقایسه ضرایب

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

$$b=4, a=-3, c=-1 \Rightarrow a+b+c = 4-3-1 = 0$$

10

15

20