

$$\frac{a+b}{a'} = \frac{a'}{b} \quad f \sim b \quad \boxed{a}$$

$$\frac{a+f}{a'} = \frac{a'}{f} \quad \frac{S_2}{S_1} = \frac{ba'}{ba} = \frac{a'}{a} = \frac{1+\sqrt{5}}{5} \quad \checkmark$$

$$a^2 - 5a + 14 = 0$$

$$a' = \frac{5 \pm \sqrt{14+49}}{5} = \frac{5 \pm 5\sqrt{5}}{5} = 1 \pm \sqrt{5}$$

(۲)

۱

$$\frac{c}{b} = \frac{1+\sqrt{5}}{2} = \frac{1}{\sin \alpha} \quad \begin{array}{c} b \\ \diagup \quad \diagdown \\ \alpha \quad c \quad a \end{array}$$

$$\sin \alpha = \frac{2}{1+\sqrt{5}} \quad \sin^2 \alpha = \frac{4}{4+4\sqrt{5}} = \frac{4}{4+4\sqrt{5}}$$

$$\cos^2 \alpha = (1 - \sin^2 \alpha) = \frac{4}{4+4\sqrt{5}} = \frac{1+\sqrt{5}}{4+4\sqrt{5}}$$

(۲)

۲

$$\left(\frac{b}{a}\right)^2 = (\tan \alpha)^2 = \frac{1}{\cos^2 \alpha} - 1 = \frac{4+4\sqrt{5}}{1+\sqrt{5}} - 1 = \frac{4}{1+\sqrt{5}} \quad \checkmark$$

$$\sqrt{2a^2 + 5a} = 2 - 3a$$

$$\Rightarrow 2a^2 + 5a = 9a^2 - 12a + 4$$

$$\Rightarrow 7a^2 - 17a + 4 = 0$$

$$a = \frac{17 \pm \sqrt{149 - 112}}{14} = \frac{17 \pm 12}{14} = 2 \text{ و } \frac{5}{14} \quad a \neq 2 \Rightarrow a = \frac{5}{14}$$

$$\frac{a+1}{a} = 1 + \frac{1}{a} = 1 + \frac{14}{5} = \frac{19}{5} \quad \checkmark$$

(۲)

۳

$$\sqrt{x+1} \left(\frac{1}{2+\sqrt{x-1}} - \frac{1}{3-\sqrt{x-1}} \right) = \sqrt{x-1}$$

$$\sqrt{x+1} \left(\frac{3-\sqrt{x-1}-3-\sqrt{x-1}}{9-x+1} \right) = \sqrt{x-1}$$

$$\sqrt{x+1} \left(\frac{-2\sqrt{x-1}}{10-x} \right) = \sqrt{x-1} \quad \left. \begin{array}{l} x \neq 1 \end{array} \right\} \Rightarrow \frac{\sqrt{x+1}}{10-x} (-2) = 1$$

به شکل دامنه ۱۰

$$\sqrt{x+1} = \frac{10-x}{-2} \Rightarrow \frac{x-10}{2}$$

$$x(x+1) = x^2 - 10x + 100$$

$$x^2 - 11x + 99 = 0$$

$$x \neq 10, 1 \quad \Delta > 0 \quad p > 0$$

$$x = 12 \pm 4\sqrt{3} \rightarrow \boxed{12 + 4\sqrt{3}} \quad \text{نقطة مثبت}$$

(۱۵)

۴

$$\frac{2-\sqrt{4-x}-\sqrt{4-x}-2}{4-(4-x)} = \frac{\sqrt{4-x}}{x}$$

$$\Rightarrow \frac{-2\sqrt{4-x}}{x} = \frac{\sqrt{4-x}}{x} \Rightarrow -10 = 2+x \Rightarrow \boxed{x = -12}$$

معادله ها تبار و فرم خود!

همیشه ریشه ای!

(۱۷)

۵

$$\frac{1}{x^2} + \frac{1}{(1-x)^2} = \frac{(1-x)^2 + x^2}{x^2(1-x)^2} = \frac{x^2 - 2x + 1 + x^2}{x^2(x-1)^2} = \frac{2x^2 - 2x + 1}{x^2(x-1)^2} = \frac{140}{9}$$

$$x(x-1) = t \Rightarrow \frac{2t+1}{t^2} = \frac{140}{9} \Rightarrow 140t^2 - 18t - 9 = 0$$

$$x^2 - x - t = 0 \quad t = \frac{18 \pm \sqrt{18^2 + 4 \times 140 \times 9}}{2 \times 140} = \frac{18 \pm 114}{280} = \frac{-3}{14} \text{ or } \frac{94}{70}$$

$$\Delta = -1 + 4t \Rightarrow \Delta > 0 \Rightarrow x^2 - x - t, \quad \text{النسبة حقیقی} \Rightarrow S_1 = 1$$

$$t > -\frac{1}{4} \Rightarrow x^2 - x - t, \quad \text{النسبة حقیقی} \Rightarrow S_4 = 1 \quad \left\{ \begin{array}{l} S = 2 \end{array} \right. \checkmark$$

دائره تابعه با دو نقطه علامت به دست می آوریم.

$$0 < -x^3 + 6x^2 + 10x - 100 = -(x+10)(x-10)(x-1)$$

$$\begin{array}{c|ccc} x & -\infty & -1 & 10 & \infty \\ \hline & + & - & + & - \end{array}$$

$$\Rightarrow D_f = F \checkmark$$

$$0 < -x^3 + 6x^2 - 1 = -(x-1)(x-2)(x+1)$$

$$\begin{array}{c|ccc} x & -\infty & -1 & 2 & \infty \\ \hline & - & + & - & + \end{array}$$

$$\sqrt{F+0} + \sqrt{14+0} = 2+F=4 \quad \text{وق}$$

$$\boxed{\text{یک جواب}} \checkmark$$

$$y = \frac{-x+14}{3}$$

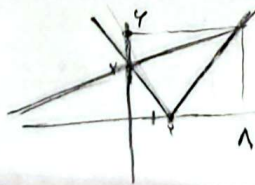
$$y = \begin{cases} 2x+1 & x \geq 1 \\ 3 & -1 \leq x < 1 \\ -2x-1 & x < -1 \end{cases}$$

$$\frac{-x+14}{3} = 2x+1 \Rightarrow -x+14 = 4x+3 \Rightarrow x=3 \quad \text{وق} \quad A = (3, 5)$$

$$\frac{-x+14}{3} = -2x-1 \Rightarrow -x+14 = -4x-3 \Rightarrow x=-5 \quad \text{وق} \quad B = (-5, 7)$$

$$AB = \sqrt{4^2 + 2^2} = \sqrt{20} = \boxed{2\sqrt{5}} \checkmark$$

$$\sqrt{x^2 - 6x + 6} = \sqrt{(x-3)^2} = |x-3|$$



$$\begin{aligned} \frac{1}{3}x + 2 &= x - 4 \\ x &= \frac{1}{2}x \\ x &= 8 \end{aligned}$$

$$(1, 4), (3, 0), (0, 2)$$

$$S = \frac{1}{4} | 4 - 12 - 12 | = \frac{1}{4} | 24 | = \boxed{6} \checkmark$$

$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{40} \Rightarrow \frac{2x+9}{x(x+9)} = \frac{1}{40} \Rightarrow x^2 + 9x = 40x + 36 \Rightarrow x^2 - 31x - 36 = 0$$

$$(x+3)(x-34) = 0$$

رقت!

$$\Rightarrow \boxed{x = 34} \checkmark$$

$$x = \text{سال ۱۳۹۹}$$