

$$\frac{y}{x} = \frac{5}{4} \text{ و } \frac{y'}{x} = \frac{1+\sqrt{5}}{2} \Rightarrow y' = x + \frac{1}{2}x\sqrt{5} \Rightarrow y' = \frac{x+x\sqrt{5}}{2} = x \frac{(1+\sqrt{5})}{2}$$

$$f_y = 5x$$

$$y = \frac{5}{4}x$$

$$\frac{S_{\text{ملازمه}}}{S_{\text{ازین}} = \frac{x \frac{(1+\sqrt{5})}{2}}{\frac{5}{4}x} = \left(\frac{2+2\sqrt{5}}{5} \right)$$

$$\text{محل } x \Rightarrow \text{محل} = \sqrt{x^2 + y^2} \quad \frac{\text{محل}}{\text{طول}} = \frac{\sqrt{x^2 + y^2}}{x} = \frac{1+\sqrt{5}}{2} \Rightarrow \frac{x^2 + y^2}{x^2} = \frac{1+5+2\sqrt{5}}{4}$$

$$\Rightarrow \frac{x^2 + y^2}{x^2} = \frac{6+2\sqrt{5}}{4} \Rightarrow \frac{x^2}{x^2} + \frac{y^2}{x^2} = \frac{3+\sqrt{5}}{2} \Rightarrow \frac{y^2}{x^2} = \frac{3+\sqrt{5}}{2} - 1 = \frac{1+\sqrt{5}}{2}$$

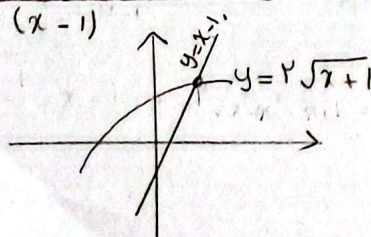
$$\frac{x^2}{y^2} = \frac{2}{1+\sqrt{5}} \times \frac{1-\sqrt{5}}{1-\sqrt{5}} = \frac{2-2\sqrt{5}}{-4} \Rightarrow \frac{2\sqrt{5}-2}{4} = \frac{\sqrt{5}-1}{2}$$

$$\sqrt{a^2 + b^2} = 2 - 3a \xrightarrow{\text{مربع کردن}} a^2 + b^2 = 4 + 9a^2 - 12a \Rightarrow 8a^2 - 12a + 4 = 0 \Rightarrow \Delta = 144 \Rightarrow a = \frac{12 \pm 12}{16} \Rightarrow a = \frac{2}{4} = \frac{1}{2}$$

$$2 = a \cdot 1 \Rightarrow \frac{2+1}{2} = \frac{3}{2}$$

$$a = \frac{2}{3} \Rightarrow \frac{\frac{2}{3} + \frac{2}{3}}{\frac{2}{3}} = \frac{\frac{4}{3}}{\frac{2}{3}} = \frac{2}{1} = 2$$

$$x \neq 1 \Rightarrow \frac{\sqrt{x+1}(3 - \sqrt{x-1} - \sqrt{x-1} - 3)}{4 - (x-1)} = \sqrt{x-1} \Rightarrow \frac{-2\sqrt{x-1}\sqrt{x+1}}{5-x} = \sqrt{x-1} \xrightarrow{\text{بهم ضرب}} 2\sqrt{x+1} = 5-x$$



$$\frac{1 \times 2\sqrt{x+1}}{4 - \sqrt{x-1}} = \frac{1 \times 2\sqrt{x+1}}{4 - \sqrt{x-1}} = \frac{\sqrt{x-1}}{5} \rightarrow \frac{2\sqrt{x+1} - 2 - \sqrt{x-1}}{(4 - \sqrt{x-1})(4 + \sqrt{x-1})} = \frac{2\sqrt{x+1}}{x+2} = \frac{\sqrt{x-1}}{5}$$

$$\sqrt{x-1} \neq 0 \Rightarrow x+2 = -1 \Rightarrow x = -3$$

صفر نیست

$$\frac{1+x^2-2x+x^2}{x^2(1-x)^2} = \frac{140}{9} \Rightarrow \frac{x^2-2x+1}{x^2+x^2-2x^2} = \frac{140}{9} \Rightarrow 18x^2-18x+9=140x^2+140x^2-28x^2$$

$$\Rightarrow 140x^2-28x^2+18x^2-18x+9=0 \Rightarrow S = \frac{-b}{a} = \frac{18}{140} = \frac{9}{70}$$

(5)

6

حاصل جمع عبارت رادیکال نامشقی است $\Rightarrow x+2 \geq 0 \Rightarrow x \geq -2$ (1)
 زیر رادیکال منفی است $\Rightarrow -x^2+9x-1 \geq 0 \Rightarrow -(x^2-9x+1) \geq 0$
 $-((x-2)(x-4)) \geq 0 \Rightarrow [2, 4]$
 $-x^2+9x-1 \geq 0 \Rightarrow -x^2(x-4)+20(x-4) \geq 0$
 $\Rightarrow (x-4)(20-x^2) \geq 0 \Rightarrow (x-4)(0-x)(0+x) \geq 0 \Rightarrow x \leq -5 \cup 5 \leq x \leq 5$ (3)

$$(1) \cap (2) \cap (3) \Rightarrow x = 4$$

پایه جواب (5)

7

نمودارهای دو تابع را در سر هم می کشیم که $x < 0$ و $x > 0$ است بررسی کنید
 $x > 0 \Rightarrow \frac{14-x}{x} = 2x+1 \Rightarrow 14-x=4x+3 \Rightarrow x=2 \Rightarrow y=5 \Rightarrow A(2, 5)$

$x < 0 \Rightarrow \frac{14-x}{x} = -2x-1 \Rightarrow 14-x=-4x-3 \Rightarrow x=-4 \Rightarrow y=5 \Rightarrow B(-4, 5)$

$$AB = \sqrt{(2-(-4))^2 + (5-5)^2} = \sqrt{4^2} = 4$$

(5)

8

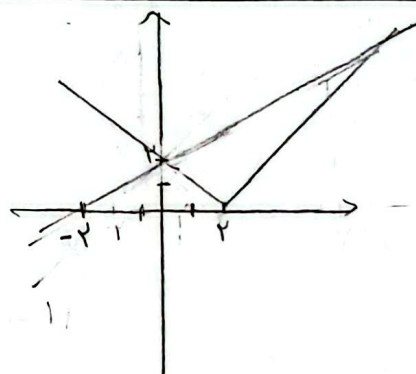
$$y = \sqrt{(x-2)^2} = |x-2|$$

$x > 0 \Rightarrow x-2 = \frac{1}{x}x+2 \Rightarrow \frac{1}{x}x=4 \Rightarrow x=4, y=4$

$x < 0 \Rightarrow 2-x = \frac{1}{x}x+2 \Rightarrow \frac{1}{x}x=0 \Rightarrow x=0, y=2$

$$\begin{array}{c|c|c} 1 & 0 & 4 \\ \hline 1 & 2 & 4 \end{array}$$

$$S = \frac{1}{x} \begin{vmatrix} 0 & 2 & 1 \\ 1 & 0 & 1 \\ 1 & 4 & 1 \end{vmatrix} = \frac{1}{x} \times 24 = 12$$



(5)

9

زمان بهروز $x \xrightarrow{\frac{1}{x}}$ $\frac{1}{x}$ $\xrightarrow{\frac{1}{x+9}}$ $\frac{1}{x+9} \Rightarrow \frac{1}{x+9} + \frac{1}{x} = \frac{1}{x}$

$$\Rightarrow \frac{x+x+9}{x(x+9)} = \frac{1}{x} \Rightarrow \frac{2x+9}{x^2+9x} = \frac{1}{x} \Rightarrow 2x+18 = x^2+9x \Rightarrow x^2-7x-18=0$$

(5)

$$\Rightarrow x(x-11) = 18 \Rightarrow x = 13$$

10