الیاس ملائی - تکلیف ش.ر ۱۸

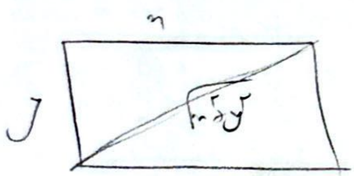
۱-

$$\frac{x}{y}=\frac{a}{4} \qquad \frac{x+a}{y}=\frac{\sqrt{a}+1}{2}$$

$$\frac{\frac{x}{y}}{\frac{x+a}{y}}=\frac{x}{x+a}=\frac{a}{4_2}\times\frac{2}{\sqrt{a}+1}=\frac{a}{2\sqrt{a}+2} \qquad \frac{S'}{S}=\frac{(x+a)y}{xy}=\frac{2\sqrt{a}+2}{a}$$

$$\frac{x+a}{x}=\frac{2\sqrt{a}+2}{a}$$

۲-



$$\frac{\sqrt{x^2+y^2}}{x}=\frac{\sqrt{a}+1}{2} \xrightarrow{(\ )^2} \frac{x^2+y^2}{x^2}=\frac{6+2\sqrt{a}}{4}$$

$$1+\frac{y^2}{x^2}=\frac{6+2\sqrt{a}}{4} = \frac{3+\sqrt{a}}{2} \qquad \frac{y^2}{x^2}=\frac{3+\sqrt{a}}{2}-1=\frac{1+\sqrt{a}}{2} \longrightarrow \frac{x^2}{y^2}=\left(\frac{x}{y}\right)^2=\frac{2}{1+\sqrt{a}}$$

۳-

$$3a+\sqrt{2a^2+4a}=2 \qquad \sqrt{2a^2+4a}=2-3a \xrightarrow{(\ )^2} 2a^2+4a=9a^2+4-12a$$

$$7a^2-16a+4=0 \qquad a^2-16a+28=0 \qquad (a-2)(a-14)=0$$

$$a=\frac{2}{7} \text{ ق ق} \qquad a=2 \text{ غ ق ق}$$

$$\frac{a+1}{a}=\frac{\frac{2}{7}+\frac{7}{7}}{\frac{2}{7}}=\frac{9}{2}$$

۴-

$$\sqrt{x+1}\left(\frac{1}{\sqrt{x-1}+3}+\frac{1}{\sqrt{x-1}-3}\right)=\sqrt{x-1} \qquad \sqrt{x+1}\left(\frac{2\sqrt{x-1}}{x-1-9}\right)=\sqrt{x-1} \quad x\neq 1$$

$$\frac{2\sqrt{x+1}}{x-10}=1 \qquad 2\sqrt{x+1}=x-10 \xrightarrow{(\ )^2} 4x+4=x^2-20x+100$$

$$x^2-24x+96=0 \longrightarrow x=12+\sqrt{48} \text{ ق ق}$$

$$x=12-\sqrt{48} \text{ غ ق ق} \longrightarrow x\geq 10$$

$x=1$ قابل قبول نیست زیرا مخرج را صفر می‌کند

پس یک ریشه مثبت دارد.

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$$\frac{1}{\sqrt{3-x}+2}+\frac{1}{\sqrt{3-x}-2}=\frac{\sqrt{3-x}}{5}\quad (x\neq 2)$$

$$\frac{\cancel{2}+\sqrt{3-x}+\sqrt{3-x}-\cancel{2}}{3-x-4}=\frac{2\sqrt{3-x}}{-x-1}=\frac{\sqrt{3-x}}{5}$$

$10=-x-1 \quad x=-11$

$x\leq 3$ ق ق ولی ریشه ی مثبت ندارد

-۶

$$\frac{x^2-2x+1+x^2}{x^2(x^2-2x+1)}=\frac{160}{9}\qquad \frac{2x^2-2x+1}{x^4-2x^3+x^2}=\frac{2x^2-2x+1}{(x^2-x)^2}=\frac{2(x^2-x)+1}{(\underbrace{x^2-x}_{t})^2}$$

$$\frac{2t+1}{t^2}=\frac{160}{9}\qquad 160t^2=18t+9\qquad 160t^2-18t-9=0\qquad t^2-18t-9\times160=0$$

$$(t-48)(t+30)=0$$

$t=\frac{48}{160}=\frac{3}{10}=x^2-x \qquad 10x^2-10x-3=0\to S=1$

$t=\frac{-30}{160}=-\frac{3}{16}=x^2-x \qquad 16x^2-16x+3=0\to S=1$

$\boxed{2}$

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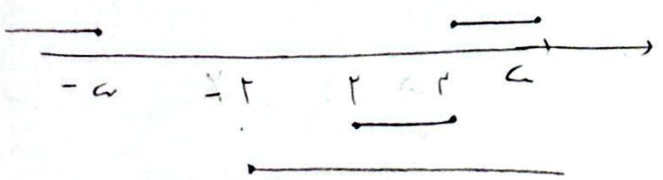
$$\sqrt{x+\sqrt{-x^2(x-4)+25(x-4)}}+\sqrt{x^2+\sqrt{-(x-2)(x-4)}}=\underbrace{x+2}_{x\geq -2}$$

$$\sqrt{x+\sqrt{(x-4)(25-x^2)}}+\sqrt{x^2+\sqrt{-(x-2)(x-4)}}$$

-5	4	5	
+	−	+	−

2	4	
−	+	−



اشتراک مجموعه $\Rightarrow x=4$ ✓

یک جواب

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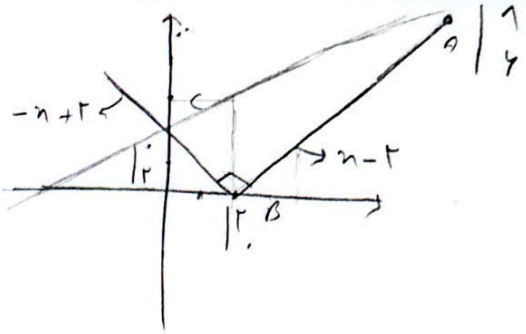
$$y=\frac{-x+17}{3}$$

$A\,|\,2,\ 5 \qquad B\,|\,-4$ ✓

$x<-2$	$-2\leq x<1$	$x\geq 1$
$-x-2-x+1=\frac{-x+17}{3}$	$x+2-x+1=\frac{-x+17}{3}$	$x+2+x-1=\frac{-x+17}{3}$
$-6x-3=-x+17$	$-x+17=9$	$2x+1=\frac{-x+17}{3}$
$5x=-20 \quad x=-4$ ✓	$x=8$ غ ق ق	$6x+3=-x+17$
		$7x=14 \quad x=2$ ✓

$$AB=\sqrt{6^2+2^2}=\sqrt{40}=2\sqrt{10}$$

$y = \frac{1}{2}x + 2$ $\quad y = |x-2|$



$x - 2 = \frac{1}{2}x + 2$

$\frac{x}{2} = 4 \quad x = 8$

$y = 6$

$BC = 2\sqrt{2}$

$AB = 6\sqrt{2}$ $\Big\}$ $S = \frac{AB \times BC}{2} = \frac{6\sqrt{2} \times 2\sqrt{2}}{2} = 12$

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$b = f - 9 \qquad f = b + 9 \qquad \frac{1}{b} + \frac{1}{b+9} = \frac{1}{20}$

$\frac{2b+9}{b^2+9b} = \frac{1}{20} \qquad 40b + 180 = b^2 + 9b \qquad b^2 - 31b - 180 = 0$

$(b-36)(b+5) = 0 \qquad b = 36$ ق

بهروز در ۳۶ ساعت کار را انجام می‌دهد.