۵: طول
۴: عرض $\rightarrow \dfrac{5+x}{4} = \dfrac{1+\sqrt{5}}{2} \rightarrow 5+x = 2+2\sqrt{5} \rightarrow x = 2\sqrt{5}-3 \rightarrow x+5 = 2+2\sqrt{5}$

$\dfrac{\cancel{4}\times(2+2\sqrt{5})}{\cancel{4}\times 5} = \dfrac{2+2\sqrt{5}}{5}$

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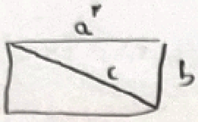
۲)



$\dfrac{\sqrt{a^2+b^2}}{a} = \dfrac{1+\sqrt{5}}{2} \rightarrow 2\sqrt{a^2+b^2} = a+\sqrt{5}a \rightarrow 4a^2+4b^2 = a^2+5a^2+2\sqrt{5}a^2$

$4a^2+4b^2 = (6+2\sqrt{5})a^2 \rightarrow 4b^2 = (2+2\sqrt{5})a^2 \rightarrow \dfrac{a^2}{b^2} = \dfrac{4}{2+2\sqrt{5}} = \dfrac{2}{1+\sqrt{5}}$

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۳)

$\sqrt{2a^2+4a} = 2-3a \rightarrow 2a^2+4a = 4+9a^2-12a \rightarrow 7a^2-16a+4 \rightarrow a^2-16a+28$

$(a-14)(a-2)=0 \quad a = \dfrac{14}{7} = 2 \,,\, \dfrac{2}{7} \qquad 2a^2+4a \geq 0 \quad a(2a+4) \geq 0 \rightarrow$

-2		0	
$+$	$-$		$+$

$2-3a \geq 0 \rightarrow 3a \leq 2 \rightarrow a \leq \dfrac{2}{3} \rightarrow a = \dfrac{2}{7}$

$\dfrac{\frac{9}{7}}{\frac{2}{7}} = \dfrac{9}{2}$

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۴)

$\sqrt{x+1}\left(\dfrac{3-\sqrt{x-1} - 3 - \sqrt{x-1}}{(3+\sqrt{x-1})(3-\sqrt{x-1})}\right) = \sqrt{x-1} \rightarrow \dfrac{\sqrt{x+1}(-2\cancel{\sqrt{x-1}})}{9-(x-1)} = \cancel{\sqrt{x-1}} \rightarrow \dfrac{-2\sqrt{x+1}}{10-x} = 1$

$2\sqrt{x+1} = x-10 \rightarrow 4x+4 = x^2+100-20x \rightarrow x^2-24x+96 = 0 \qquad 24^2-(4\times 96) = 192$

$\dfrac{24 \pm \sqrt{192}}{2} \rightarrow \dfrac{24+8\sqrt{3}}{2} = \dfrac{12+4\sqrt{3}}{2} \,,\, \dfrac{12-4\sqrt{3}}{2} \rightarrow$ غ ق ق

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۵)

$\dfrac{1}{t+2} - \dfrac{1}{2-t} = \dfrac{t^2}{5t} \rightarrow \dfrac{\cancel{2}-t-t-\cancel{2}}{4-t^2} = \dfrac{t}{5} \rightarrow \dfrac{-2t}{4-t^2} = \dfrac{t}{5}$

$-10t = 4t - t^3 \rightarrow t^3 - 14t = 0 \quad t(t^2-14) = 0 \quad t=0 \quad t = \pm\sqrt{14}$

$\sqrt{2-x} = 0 \rightarrow x = 2 \qquad \sqrt{2-x} = \sqrt{14} \rightarrow x = \alpha$

$\boxed{1}$ معلم ریاضی شیخ نظر

شهرزاد شوشتری

۶)

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

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

$18^2+4(140\times9) \to \sqrt{6084}=78 \to \frac{18\pm78}{280}$ $\nearrow t=\frac{3}{10} \to x^2-x-\frac{3}{10}=0$ $\searrow t=-\frac{3}{14} \to x^2-x+\frac{3}{14}=0$

$S=\frac{-b}{a}=1+1=2$

۷)

$-x^2+6x-8\geq0 \to x^2-6x+8\leq0 \to (x-2)(x-4)\leq0$ $\begin{array}{ccccc} & 2 & & 4 & \\ + & | & - & | & + \end{array} \to x\in[2,4]$

$-x^3+4x^2+25x-100\geq0 \to x^2(-x+4)+25(x-4)\geq0 \to (x-4)(-x^2+25)\geq0$

$-5\leq x\leq5,\ x\geq4 \to$ $-5\leq x,\ 4\leq x\leq5 \to 4 \to \sqrt{4}+\sqrt{16}=2+4=4+2$ ✓

۸)

$-2x-1$	3	$2x+1$
	-2	1

$2x+1=-\frac{x}{3}+\frac{17}{3} \to 6x+3=-x+17 \to x=2,\ y=5$

$-2x-1=-\frac{x}{3}+\frac{17}{3} \to -6x-3=-x+17 \to x=-4,\ y=7$

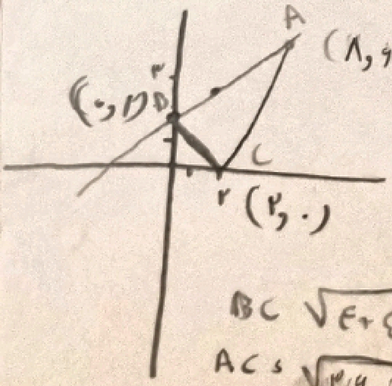
$AB=\sqrt{4+36}=\sqrt{40}=2\sqrt{10}$

۹)

$y=\frac{1}{2}x+2 \to x=0 \to y=2\quad(0,2)$

$x=2 \to y=3\quad(2,3)$

$y=\sqrt{x^2-4x+4}=\sqrt{(x-2)^2}=|x-2|$



$x-2=\frac{1}{2}x+2 \to 2x-4=x+4 \to x=8 \to y=6$

$x-2=-\frac{1}{2}x-2 = 2x-4=-x-4 \to \varnothing$

$BC=\sqrt{4+4}=2\sqrt{2}$

$AC=\sqrt{36+36}=6\sqrt{2}$

$\frac{\cancel{2}\sqrt{2}\times6\sqrt{2}}{\cancel{2}}=12$

شهرزاد شرشری

بهروز	x	$\frac{1}{x}$
فرهاد	$x+9$	$\frac{1}{x+9}$
هر دو	20	$\frac{1}{20}$

$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{20} \rightarrow \frac{x+9+x}{x^2+9x} = \frac{1}{20} \rightarrow \frac{2x+9}{x^2+9x} = \frac{1}{20}$$

$$40x + 180 = x^2 + 9x \rightarrow x^2 - 31x - 180 = 0 \quad (x-36)(x+5) = 0 \quad \boxed{x = 36}$$

$$x = -5 \times$$