۱۶/۵

نام و نام خانوادگی ...ستایش امامی...... پاسخنامه تشریحی تکلیف شماره ...۱۰... کلاس ...یازدهم تجربی B......

| | |
|---|---|
| $\frac{x}{y}=\frac{5}{4} \Rightarrow x=\frac{5}{4}y$ <br> $S_{\text{اولیه}}=\frac{5}{4}y\times y=\frac{5}{4}y^2$ طول جدید $=\left(\frac{1+\sqrt5}{2}\right)y$ <br> $S_{\text{مستطیل جدید}}=\frac{1+\sqrt5}{2}y\times y=\frac{1+\sqrt5}{2}y^2$ $\frac{\text{جدید}}{\text{اولیه}}=\frac{\frac{1+\sqrt5}{2}y^2}{\frac{5}{4}y^2}=\frac{2+2\sqrt5}{5}$ <br> (۲) | ۱ |
| $x^2+y^2=d^2 \Rightarrow$ قطر $d=\sqrt{x^2+y^2}$ $\frac{d}{x}=\frac{1+\sqrt5}{2} \Rightarrow \frac{\sqrt{x^2+y^2}}{x}=\frac{1+\sqrt5}{2}$ <br> $\Rightarrow \sqrt{x^2+y^2}=\sqrt{x^2(1+(\frac{y}{x})^2)}=x\sqrt{1+(\frac{y}{x})^2}$ <br> $\left(\frac{\cancel{x}\sqrt{1+(\frac{y}{x})^2}}{\cancel{x}}=\frac{1+\sqrt5}{2}\right)^2 \Rightarrow 1+(\frac{y}{x})^2=\frac{1+2\sqrt5+5}{4} \Rightarrow (\frac{y}{x})^2=\frac{6+2\sqrt5}{4}-1=\frac{2+2\sqrt5}{4}=\frac{1+\sqrt5}{2}$ <br> $\Rightarrow (\frac{x}{y})^2=\frac{2}{1+\sqrt5}$ $\frac{2}{1+\sqrt5}\times\frac{1-\sqrt5}{1-\sqrt5}=\frac{2-2\sqrt5}{1-5=-4}=\frac{\sqrt5-1}{2}$ <br> (۴) | ۲ |
| $3a+\sqrt{2a^2+4a}=2 \Rightarrow \sqrt{2a^2+4a}=2-3a$ <br> $\Rightarrow 2a^2+4a=4-12a+9a^2 \Rightarrow 7a^2-16a+4=0$ $\Delta=256-112=144$ <br> $a=\frac{16\pm12}{14}\begin{cases}2 \times \text{غ ق ق}\\ \frac{4}{14}\checkmark\end{cases}$ $\frac{a+1}{a}=1+\frac{1}{a} \Rightarrow 1+\frac{14}{4}=\frac{18}{4}=\frac{9}{2}$ <br> (۴) | ۳ |
| $\sqrt{x-1}=t \Rightarrow x=t^2+1$ <br> $\sqrt{x+1}=\sqrt{t^2+2}$ <br> $\frac{\sqrt{t^2+2}}{t+3}-\frac{\sqrt{t^2+2}}{3-t}=\frac{t^{\cancel{2}}}{\cancel{t}} \Longrightarrow \sqrt{t^2+2}\underbrace{\left(\frac{1}{t+3}-\frac{1}{3-t}\right)}_{\frac{-2t}{9-t^2}}=\frac{2\cancel{t}\sqrt{t^2+2}}{t^2-9}=\cancel{t}$ <br> $\left(2\sqrt{t^2+2}=t^2-9\right)^2 \Rightarrow 4t^2+8=t^4-18t^2+81$ $t\neq3$ <br> $\Rightarrow t^4-22t^2+73=0 \xRightarrow{t^2=z} z^2-22z+73=0$ <br> $\Rightarrow \Delta=484-292=192$ $z=11\pm4\sqrt3$ <br> $\Rightarrow t^2=11\pm4\sqrt3$ چون $t>3$ باید باشد $11-4\sqrt3$ قابل قبول نیست ← یک ریشه مثبت دارد <br> $\Rightarrow t^2=11+4\sqrt3 \Rightarrow t=\sqrt{11+4\sqrt3}$ و $\sqrt{11+4\sqrt3}>3\checkmark$ $x=t^2+1=11+4\sqrt3+1=\boxed{12+4\sqrt3}$ | ۴ |
| $\sqrt{2-x}=t$ $x=-t^2+2$ <br> $\frac{1}{t+2}-\frac{1}{2-t}=\frac{t^2}{5t} \Rightarrow \frac{-2t}{4-t^2}=\frac{-2t}{4-t^2}=\frac{2t}{t^2-4} \Rightarrow \frac{2t}{t^2-4}=\frac{t^2}{5t} \Rightarrow 10t^2=t^4-4t^2 \Rightarrow t^4-14t^2=0$ <br> $\xRightarrow{t^2=z} z^2-14z=0$ $\Delta=196$ $z=\frac{14\pm14}{2}\begin{cases}0\\14\end{cases} \Rightarrow z=t^2$ $x=-t^2+2 \Rightarrow x=\begin{cases}2\checkmark\\-12\times \text{ریشه منفی}\end{cases}$ <br> $x\neq2$ و <br> معادله یک ریشه مثبت دارد | ۵ |

$$\left(\frac{1}{x^2}+\frac{1}{(1-x)^2}=\frac{160}{9}\right)\Rightarrow \frac{\overbrace{x^2+(1-x)^2}^{2x^2-2x+1}}{x^2(1-x)^2}=\frac{2(x-\frac12)^2+\frac12}{(\frac14-(x-\frac12)^2)^2}=\frac{2t+\frac12}{(\frac14-t)^2}=\frac{160}{9}$$

$(x-\frac12)^2=t \qquad \underbrace{x(1-x)}_{x-x^2}=\frac14-(x-\frac12)^2$ ۲ ۶

$\Rightarrow 10-80t+160t^2-18t+\frac92 \Rightarrow 160t^2-98t+5.5=0 \Rightarrow 320t^2-196t+11=0$

$\Delta=24336 \qquad \frac{+196\pm156}{640}=\begin{cases}\frac{+40}{640}=+\frac1{16}\\ \frac{+352}{640}=+\frac{11}{20}\end{cases}$

$x-\frac12=\pm\sqrt t\Rightarrow\begin{cases}x=\frac12\pm\frac14 \quad \{\frac34,\frac14\}\\ x=\frac12\pm\sqrt{\frac{11}{20}}\end{cases}$ جمع ریشه‌ها $=\frac14+\frac34+\frac12+\sqrt{\frac{11}{20}}+\frac12-\sqrt{\frac{11}{20}}=2$

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1) $-x^3+4x^2+25x-100\geq 0 \to x\in[-\infty,-5]\cup[4,5]$ $\qquad x+2\geq 0\to x\in[-2,+\infty)$

2) $-x^2+6x-8\geq 0\to x\in[2,4]$ ۱

3) $x+\underbrace{\sqrt{-x^3+4x^2+25x-100}}_{+}\geq 0 \qquad x\geq 0$ $\qquad x=4\to 2+4=6$ ۷

معادله یک جواب دارد

4) $x^2+\sqrt{-x^2+6x-8}\geq 0\to$ همواره مثبت

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$|\underset{-2}{x+2}|+|\underset{+1}{x-1}|=\frac{17-x}{3}$

| $x<-2$ | $-2\le x<1$ | $x\ge 1$ |
|---|---|---|
| $-x-2-x+1=\frac{17-x}{3}$ | $x+2-x+1=\frac{17-x}{3}$ | $x+2+x-1=\frac{17-x}{3}$ |
| $-5x=20$ | $9=17-x$ | $6x+3=17-x$ |
| $x=-4$ | $x=8$ ✗ | $7x=14\Rightarrow x=2$ ✓ |
| $-4<-2$ ✓ | | |

$x=2$ و $-4$ ۲ ۸

$x=-4 \quad y=7$

$x=2 \quad y=5$

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

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$y=\sqrt{x^2-4x+4}=\sqrt{(x-2)^2}=|x-2| \qquad y=\frac12x+2$

$\begin{cases}x-2=\frac12x+2\Rightarrow\frac12x=4\Rightarrow x=8 & y=6\\ 2-x=\frac12x+2\Rightarrow-\frac32x=0\Rightarrow x=0 & y=2\end{cases}$ $\qquad |x-2|=\frac12x+2$ ۰/۵

$A(0,2)\ B(2,0)\ C(8,6)$ ۹

$AB=2\sqrt2 \qquad S=\frac{2\sqrt2\times6\sqrt2}{2}=12$

$BC=6\sqrt2$

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$\frac1x+\frac1{x-9}=\frac1{20}\Rightarrow\frac{2x-9}{x^2-9x}=\frac1{20}$

$x^2-9x=40x-180\Rightarrow x^2-49x+180=0$ ۲

$\Delta=1681 \qquad x=\frac{49\pm41}{2}\begin{cases}4 \times \text{غ ق ق}\\ 45\end{cases}$ ۱۰

$\boxed{45-9=36h}$