یازدهم ریاضی ج ۱۸ - کاظم نظری

۱۴,۷۵

Date No

۱- $\frac{x}{y}=\frac{5}{4}$, $S=xy$, $S'=x'y$ ۵

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

$\rightarrow \frac{x'}{y}=\frac{1+\sqrt5}{2} \rightarrow x'=\frac{(1+\sqrt5)y}{2}$, $\frac{S'}{S}=\frac{x'y}{xy}=\frac{x'}{x}=\frac{\frac{(1+\sqrt5)y}{2}}{\frac{5y}{4}}=\frac{2+2\sqrt5}{5}$

۲- $\frac{\sqrt{x^2+y^2}}{x}=1/618 \rightarrow \frac{x^2+y^2}{x^2}=(1/618)^2 \rightarrow 1+\frac{y^2}{x^2}=\frac{3+\sqrt5}{2}$ ۵

$\Rightarrow \frac{y^2}{x^2}=\frac{1+\sqrt5}{2} \rightarrow \frac{x^2}{y^2}=\frac{2}{1+\sqrt5}\times\frac{-1+\sqrt5}{-1+\sqrt5}=\frac{2\sqrt5-2}{4}=\frac{\sqrt5-1}{2}$

۳- $\sqrt{2a^2+4a}=2-3a \rightarrow 2-3a\geq0 \rightarrow a\leq\frac{2}{3}$ ۵

$\rightarrow 2a^2+4a=4+9a^2-12a \rightarrow 7a^2-16a+4=0 \rightarrow a=\frac{16\pm\sqrt{144}}{14}$ $a=\frac{4}{14}=\frac{2}{7}$, $a=2$ غ ق ق

$\rightarrow \frac{a+1}{a}=\frac{\frac{2}{7}+\frac{7}{7}}{\frac{2}{7}}=4/5$

۴- $x>1$ $x\neq10$ $\sqrt{x-1}=t \rightarrow \frac{\sqrt{x+1}}{t+3}-\frac{\sqrt{x+1}}{-t+3}=\frac{t^2}{t}$ ۵

$\rightarrow \frac{-t\sqrt{x+1}+3\sqrt{x+1}-t\sqrt{x+1}-3\sqrt{x+1}}{9-t^2}=\frac{t^2}{t}$

$\Rightarrow \frac{-2\sqrt{x-1}\times\sqrt{x+1}}{-x+10}=\sqrt{x-1} \rightarrow -2\sqrt{x+1}=10-x \rightarrow 4x+4=x^2-20x+100$

$\rightarrow x^2-24x+96=0 \rightarrow x=12\pm4\sqrt3 \Rightarrow x=12+4\sqrt3$ غ ق ق

۵- $\sqrt{2-x}=t \rightarrow x<2$, $x\neq\pm2$, $x=-12$ ریشه منفی است پس معادله هیچ ریشه مثبتی ندارد ۱,۷۵

$\frac{1}{t+2}-\frac{1}{2-t}=\frac{t}{5} \rightarrow \frac{2-t-t-2}{4-2+x}=\frac{\sqrt{2-x}}{5} \rightarrow \frac{-2\sqrt{2-x}}{2+x}=\frac{\sqrt{2-x}}{5} \rightarrow 2+x=-10 \Rightarrow x=-12$

۶- $\frac{x^4+x^2-2x+1}{x^2(1-x)^2}=\frac{160}{9} \rightarrow \frac{2x^2-2x+1}{x^2(1-x)^2}=\frac{1-2x(1-x)}{x^2(1-x)^2}$ $x(1-x)=t$ $\frac{1-2t}{t^2}=\frac{160}{9}$ ۵

$x\neq0,1$

$\rightarrow 9(1-2t)=160t^2 \rightarrow 160t^2+18t-9=0 \xrightarrow{روش} t^2+18t-9\times160=0$ ① $t=\frac{3}{16} \rightarrow -x^2+x-\frac{3}{16}=0$ ۲ ریشه ② $t=-\frac{3}{10} \rightarrow -x^2+x+\frac{3}{10}$ ۲ ریشه

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

۷- ۱) $-x^3+4x^2+25x-100\geq0 \rightarrow x\in[-\infty,-5]\cup[4,5]$ $x+2\geq0 \rightarrow x\in[-2,+\infty)$ ۵

۲) $-x^2+6x-8\geq0 \rightarrow x\in[2,4]$ $x=4 \rightarrow 2+4=6$

۳) $x+\sqrt{-x^3+4x^2+25x-100}\geq0$ $x\geq0$ معادله یک جواب دارد

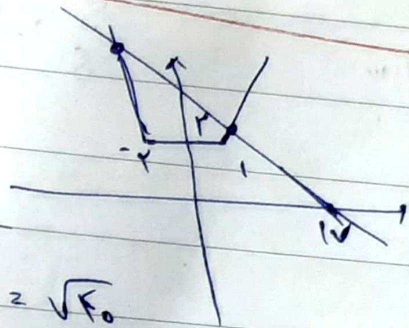
۴) $x^2+\sqrt{-x^2+6x-8}\geq0 \rightarrow$ همواره مثبت

dotnote

۸- $y = \dfrac{\cancel{}17 - x}{3}$ $\quad y = |x+2| + |x-1|$

$17 - x = 3|x+2| + 3|x-1|$

$\Rightarrow \begin{vmatrix} 2 \\ 5 \end{vmatrix} \quad \begin{vmatrix} -4 \\ 7 \end{vmatrix} \to \sqrt{36+4} = \sqrt{40}$



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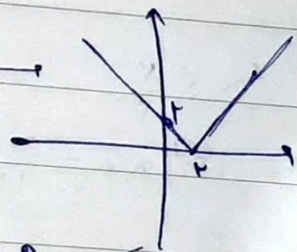
۹- $y = \sqrt{(x-2)^2} = |x-2| \longrightarrow$



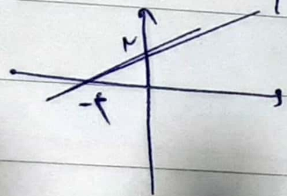
$|x-2| = \frac{1}{2}x + 2$

$A(0,2) \quad B(2,0) \quad C(8,6)$

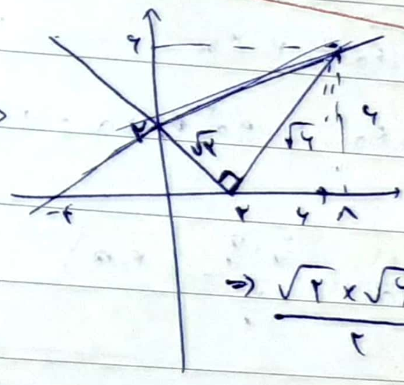
$AB = 2\sqrt{2} \qquad S = \dfrac{2\sqrt{2} \times 6\sqrt{2}}{2} = 12$

$BC = 6\sqrt{2}$

$y = \frac{1}{2}x + 2 \longrightarrow$



$\Rightarrow$



$\Rightarrow \dfrac{\sqrt{2} \times \sqrt{6}}{2} = \dfrac{\sqrt{12}}{2}$

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۱۰- $\dfrac{1}{B} + \dfrac{1}{B+9} = \dfrac{1}{20} \longrightarrow \dfrac{B + B + 9}{B^2 + 9B} = \dfrac{1}{20} \Rightarrow 40B + 180 = B^2 + 9B$

$\Rightarrow B^2 - 31B - 180 = 0 \Rightarrow B = \dfrac{31+41}{2} = \boxed{36}$

$\downarrow$ بهروز $\qquad \downarrow$ فرهاد

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