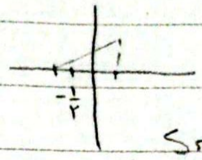
Subject:

Year : Month : Day : ( ) دوازدهم تجربی B تکلیف ۱۰ حدیث بهشتی پور page:( )

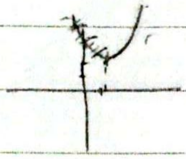
۱) $f: 2y = 3x - 1 \longrightarrow f^{-1}: 3x = 2y + 1 \quad y \leftrightarrow x \quad y = \frac{2x+1}{3}$



$\frac{2x+1}{3} = 0 \longrightarrow 2x + 1 = 0 \longrightarrow 2x = -1 \quad x = -\frac{1}{2}$

$S = \frac{\frac{1}{3} \times \frac{1}{2}}{2} = \frac{\frac{1}{6}}{2} = \frac{1}{12}$

۲) الف) $y = x^2 - 2x + 3 \quad x = 1,\ y = 2$



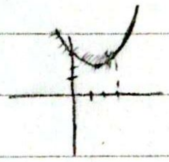
یک به یک هست $D_{f^{-1}} = [2, +\infty)$

$y^{-1} = x^2 - 2x + 3 - 2 + 2$

$y = (x-1)^2 + 2 \longrightarrow \sqrt{y-2} = \sqrt{(x-1)^2} \longrightarrow |x-1| = \sqrt{y-2} \longrightarrow x - 1 = \sqrt{y-2}$

$y^{-1} = \sqrt{x-2} + 1$

ب) $y = x^2 - 2x + 3 \quad x = 1,\ y = 2$



یک به یک هست $D_{f^{-1}} = [6, +\infty)$

$x = 3,\ y = 6$

$y^{-1} = \sqrt{x-2} + 1$

۳) $y = 2x - \sqrt{16 - 4x(4-x)} \Longrightarrow 2x - \sqrt{4(x-2)^2} = 2x - 2|x-2|$

$16 - 16x + 4x^2 \qquad 2|x-2|$

$4(x^2 - 4x + 4)$

$(x-2)^2$

	2	
	$2x + 2x - 4$	$2x - 2x + 4$
	$4x - 4$	4

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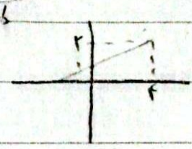
$y = 4x - 4$ وارون $4x = y + 4 \quad y \leftrightarrow x \quad y = \frac{x+4}{4}$



$S = \frac{4 \times (1+2)}{2} = 6$

۴) هم علامت

$y = \frac{x}{\sqrt{x^2 - 5}} \longrightarrow y^2 = \frac{x^2}{x^2 - 5} \longrightarrow y^2x^2 - 5y^2 = x^2$

$x^2(y^2 - 1) = 5y^2$

$x_1 = \frac{x_1^2}{x_1^2 - 5} = \frac{x_2^2}{x_2^2 - 5} \Longrightarrow x_1^2 = x_2^2 \qquad x^2 = \frac{5y^2}{y^2 - 1} \longrightarrow y^2 = \frac{5x^2}{x^2 - 1} \to y = \pm\sqrt{\frac{5x^2}{x^2 - 1}}$

$x_1 = \cancel{\pm} x_2$

✓ یک به یک هست

۵) $g(x) = \begin{cases} x^2 - 4x + k & x \geq 2 \\ -x^2 + 6x + 3k & x < 2 \end{cases}$

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$y=4x$

$x=4y$

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

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$f(x)=3x+|x| \quad \begin{cases} \xrightarrow{x\geq 0} 4x \\ \xrightarrow{x<0} 2x \end{cases} \longrightarrow f^{-1}(x) \begin{cases} \xrightarrow{x\geq 0} \frac{x}{4} \\ \xrightarrow{x<0} \frac{x}{2} \end{cases}$

$a=\dfrac{\frac{1}{4}+\frac{1}{2}}{2}=\frac{3}{8} \qquad x=1,\ y=\frac{1}{4} \qquad ax+b=\frac{1}{4} \qquad b=\frac{1}{4}-\frac{3}{8}=-\frac{1}{8}$

$a\times b=\frac{3}{8}\times-\frac{1}{8}=\boxed{\frac{-3}{64}}$

(7

$f(x)=\dfrac{3x+4}{x+m} \xrightarrow[y=-10]{x=2} -10=\dfrac{10}{2+m} \longrightarrow -20-10m=10 \quad 10m=-30 \quad m=-3$

$f^{-1}(x) \Rightarrow \dfrac{3y+4}{y-3}=x \longrightarrow f^{-1}=\dfrac{-3x-4}{3-x}$

$f^{-1}(x)+f\circ f^{-1}(x)=x \longrightarrow \dfrac{-3x-4}{3-x}+\cancel{x}=\cancel{x} \longrightarrow \dfrac{-3x-4}{3-x}=0 \Rightarrow -3x-4=0$

$-3x=4$

$\boxed{x=-\frac{4}{3}}$

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$f(3-2x)=2-g\left(\frac{x}{2}\right) \longrightarrow \underbrace{g\left(\frac{x}{2}\right)}_{4}=2-f(3-2x) \rightarrow 2-f(3-2x)=4$

$f(3-2x)=-2$

$f^{-1}\Big|\begin{matrix}-2\\3-2x\end{matrix}$

$2-g\left(\frac{x}{2}\right)=-2$

$g\left(\frac{x}{2}\right)=4 \qquad g^{-1}\Big|\begin{matrix}4\\ \frac{x}{2}\end{matrix}$

$4g^{-1}(4)+f^{-1}(-2)=4\times\frac{x}{2}+3-2x=$

$2x+3-2x=3$

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$y=\dfrac{5x-13}{1-x} \xrightarrow[y=-y]{x=-x} -y=\dfrac{-5x-13}{1+x} \xrightarrow{(x-2)} -y=\dfrac{-5(x-2)-13}{1+(x-2)}-3$

$f=\dfrac{5x+3}{x-1}-3 \longrightarrow \dfrac{5x+3-3x+3}{x-1} \Rightarrow f=\dfrac{2x+6}{x-1} \longrightarrow f^{-1} \Rightarrow \dfrac{2y+6}{y-1}=x$

$f^{-1}=\dfrac{x+6}{x-2} \qquad \dfrac{x+6}{x-2}=\dfrac{2x+6}{x-1} \Rightarrow x^2+5x-6=2x^2+2x-12$

$x^2-3x-6 \longrightarrow S=3$

(10

$f(x)=x+4[x] \longrightarrow -y=-x+4[-x]$

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